ANALYSIS OF A FORCED LIMIT-CYCLING REGULATOR

by

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UNITED STATES
NAVAL POSTGRADUATE SCHOOL

THESIS

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ABSTRACT

The recent introduction of high current-capacity thyristors has advanced the status of solid-state power supplies. ON-OFF switching of an entire rectifier bridge, rather than individual thyristors, provides a simple and economical method of control and regulation. This control philosophy causes the system to limit cycle.

A describing function is developed to model the power-supply input transformer and rectifier bridge. The describing function is then used to predict the frequency and amplitude of the limit cycle.

A digital computer program is used to construct the describing function curves, and to simulate the dynamic response of the system. Limit cycle predictions are compared with the simulated response to verify the describing function validity.

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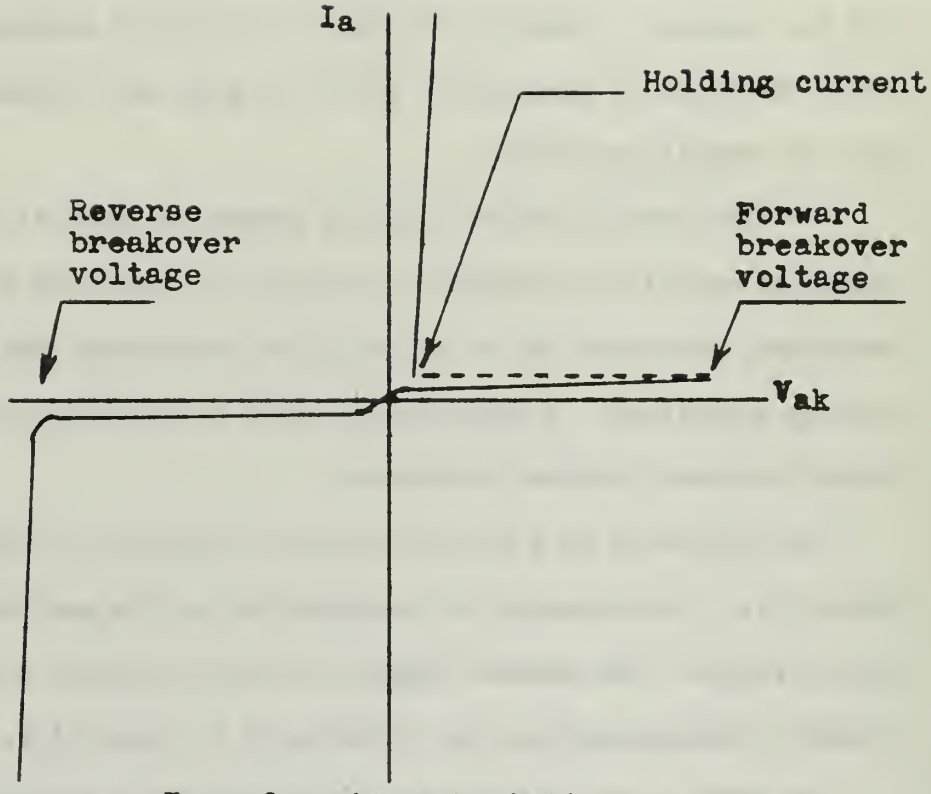
1. Introduction

The recent advent of large current-capacity, solid-state, controlled rectifiers promises to revolutionize the field of power conversion. It is forseeable that in the 1970's the major portion of power conversion will be accomplished by static rather than rotating devices. However, to tip the balance in favor of the static conversion systems, they must prove to be economically competetive and be as good as or superior in performance to rotating machinery.

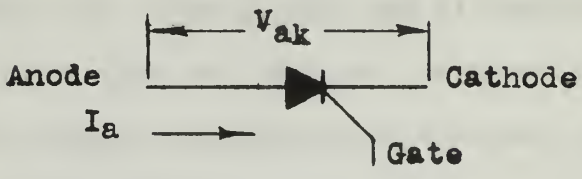
In this study a system that has promise in each of the areas mentioned above will be examined. The specific system to be examined is a polyphase, thyristor, AC to DC rectifier, operating under forced limit-cycling conditions. A mathematical model is proposed and then analyzed, using frequency response techniques.

The thyristor is a three-terminal, four-layer, bi-stable solid-state device [4]. Functionally it is equivalent to its gas tube counterpart, the thyratron. The circuit symbol for the thyristor, along with typical transfer characteristics, are illustrated in figure 1-1.

As shown by the transfer characteristics and symbolically indicated, the device is basically a diode. However, the forward resistance is bi-stable and controllable. In general the forward breakover voltage is inversely proportional to the gate current. This would seem to indicate that the device could be controlled by controlling the level of gate current. However, due to wide variation in characteristics from one device to another and temperature dependence, control of the gate current level is not satisfactory. In conventional applications, the gate current is held low or made negative when blocking is desired, and then switched to a level high enough to insure that the device is placed in a conducting



a. Transfer characteristic



b. Circuit symbol

Figure 1-1

Thyristor Transfer Characteristics

state at the desired time. In this mode of operation the thyristor acts as a latching relay. As indicated on the transfer characteristics, two conditions must be met to place the thyristor in an off* state once it has been turned on. First, the anode-cathode voltage must be below a certain minimum level, and secondly, the forward current must be less than the holding current. The thyristor finds its most logical application in the field of alternating-current rectification where these two shut-off conditions naturally occur. The advantage the thyristor enjoys over the common diode is that the control of the forward break-over voltage provides a means by which the interval of forward conduction, and thus the amount of power per cycle, may be regulated. In theory, conduction can be obtained from zero to one hundred eighty degrees for half-wave rectification.

In general, the development of firing circuits to regulate the conduction angle has relied heavily on past experience with gas-tube circuits. The most straight forward circuits use a phase-shifted wave derived from the source being rectified. This may prove satisfactory for the majority of applications, due to its simplicity and the fact that it carries an inherent timing that is locked to the source wave.

However as more stringent requirements are placed on the performance of the overall rectification system in terms of response, regulation, and frequency content of the output voltage, it is found that more precise timing is required of the firing circuit.

In polyphase rectification, separate firing circuits for each phase

*For convenience of notation "ON" will denote the condition when the thyristor conducts forward current with low voltage drop (low forward resistance), and "OFF" will denote blocking in either direction (high resistance).

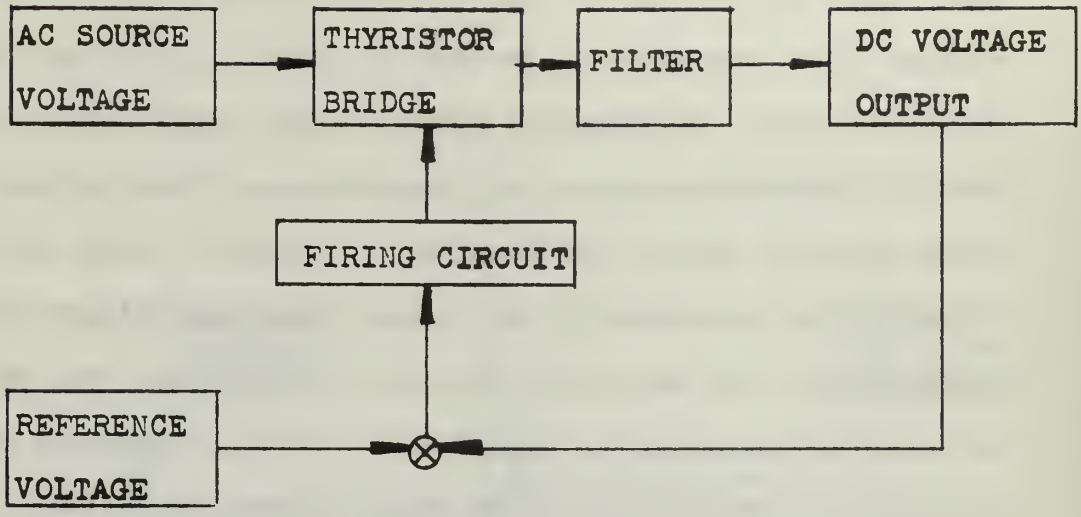


Figure 1-2

Block Diagram for Regulated Thyristor Power Supply.

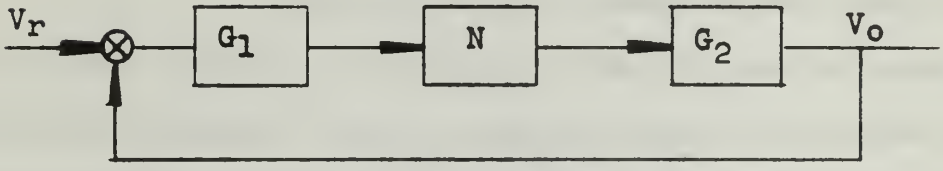


Figure 1-3

Simplified Block Diagram.

along with phasing and timing circuits to insure proper sequencing of the firing, must be provided. A three-phase, full-wave rectifier would thus require six separate firing circuits.

The method considered here simplifies the control philosophy and circuitry so that the entire bridge for a polyphase system is controlled as a unit, rather than by individual devices. The gates of all the thyristors in the polyphase bridge are connected in parallel and a single firing signal is provided to all devices. The firing signal is further simplified in that no attempt is made to phase it with the source voltage. Thus the entire bridge is either ON, and acts as a conventional diode bridge, or it is OFF and has effectively zero power output. A simplified circuit diagram is contained in appendix III.

The system in its simplest block-diagram form is illustrated in figure 1-2.

Conceptually the system operates as follows. Assume that the output voltage is below the reference voltage. The rectifier bridge is then supplied with an ON signal, and the bridge output to the filter is a three-phase, full-wave, rectified voltage. The filter attenuates the harmonics of this voltage and provides a relatively smooth DC voltage at the output. When the DC voltage rises above the reference level the bridge is supplied with an OFF signal. There is a time delay before the bridge turns off, in that the shut-off conditions for each thyristor must be met. The time delay is of the order of ½ cycle of the supply frequency. In the OFF state the input voltage to the filter is zero, with reverse current essentially blocked. The bridge will remain in the OFF state until the output voltage falls below the reference, whereupon the cycle will repeat itself. This limit-cycling of the system is the particular area of interest to be considered here.

In order to facilitate analysis, the system components are lumped and partitioned as illustrated in figure 1-3.

To justify this partioning the following argument is offered. First, it is assumed that the switching of the rectifier bridge is periodic, hence its output will be periodic and can be represented by a Fouier series. Thus the source and rectifier bridge are represented as block "N" which is assumed to have a periodic input and output. The general nature of this block is nonlinear, and more will be said about this later. Secondly, it is assumed that the filter and load are entirely linear, and these are represented as block "G_2". Block "G_1" is included to take into account any gain that may be associated with the comparitor, firing circuits and compensation that may be added to the system. Again this block is assumed to be entirely linear in nature. Thus in conventional transfer function notation:

$$\frac{V_o}{V_r} = \frac{G_1 G_2 N}{1 + G_1 G_2 N}$$

Procedures for analysis of the linear portion of the system have been previously established and accepted. For the nonlinear portion there is generally no exact method for relating the output to the input, in closed form, that will cover the entire range of operation of the system. Most techniques of nonlinear analysis use some sort of approximation that in a sense assumes linearity of the system over the desired range of operation to be considered.

One method that has been found to give rather good results is that of the describing function, first introduced in this country by R. J. Kochenburger [2] in his description of relay servos in 1949.

The basic philosophy of the describing function is to imagine that the open-loop control system is excited at its input by a minute, sinusoidal

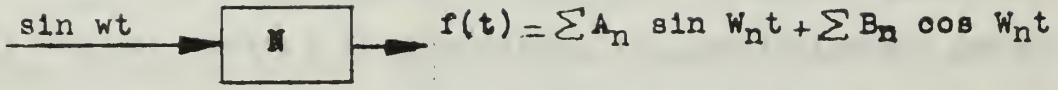


Figure 1-4

forcing function. The output of the non-linearity is then periodic and can be represented by a Fourier series. This is illustrated in figure 1-4.

It is then assumed (a necessary condition) that the linear portion of the system following the nonlinearity is a perfect low-pass filter. This is the case in most physical systems. Thus it is assumed that the only terms of the Fourier series that are passed to the output of the filter are the DC term and the first harmonic. When the loop is closed this first harmonic, being the same as the original excition frequency, will propogate itself around the loop and result in a continuous oscillation of the system, provided certain conditions exist.

The describing function then represents a nonlinear block in much the same way a transfer function represents a linear block. That is, it operates on the input to the block with a gain and a phase shift. In general this operation is dependent upon both the frequency and magnitude of the input.

In order to arrive at the describing function for a nonlinearity, one must have some idea of what the periodic output is like. This wave form may be known from actual observation, or may be deduced from reasoning of how the nonlinearity would respond to a sinusoidal excitation.

If this output is represented as a Fourier series we have:

$$f(t) = \frac{A_0}{2} + A_1 \cos\omega t + B_1 \sin\omega t \ldots + A_n \cos n\omega t + B_n \sin n\omega t \quad (1\text{-}1)$$

The coefficients of the series are found by integrating the following expressions:[4]

$$A_n = \frac{2}{\pi}\int_0^{\pi} f(t) \sin n\omega t \, d\omega t \quad (1\text{-}2)$$

$$B_n = \frac{2}{\pi}\int_0^{\pi} f(t) \cos n\omega t \, d\omega t \qquad (1\text{-}3)$$

As mentioned previously, one of the basic premises of describing function philosophy is that only the first harmonic properties around the control loop. Thus the only coefficients of the above series that are of interest are the first and the integration of (1-2) and (1-3) is simplified.

The describing function is then defined as the ratio [3], [5] of the first harmonic output (in gain and phase) to the input.

Thus for the system as illustrated in figure 1-4 the describing function is given as:

$$N = \frac{\sqrt{A_1^2 + B_1^2}}{B} \Big/ \underline{\tan^{-1}\frac{A_1}{B_1} - \angle B \sin \omega t} \qquad (1\text{-}4)$$

The above criteria will now be applied to the system under consideration.

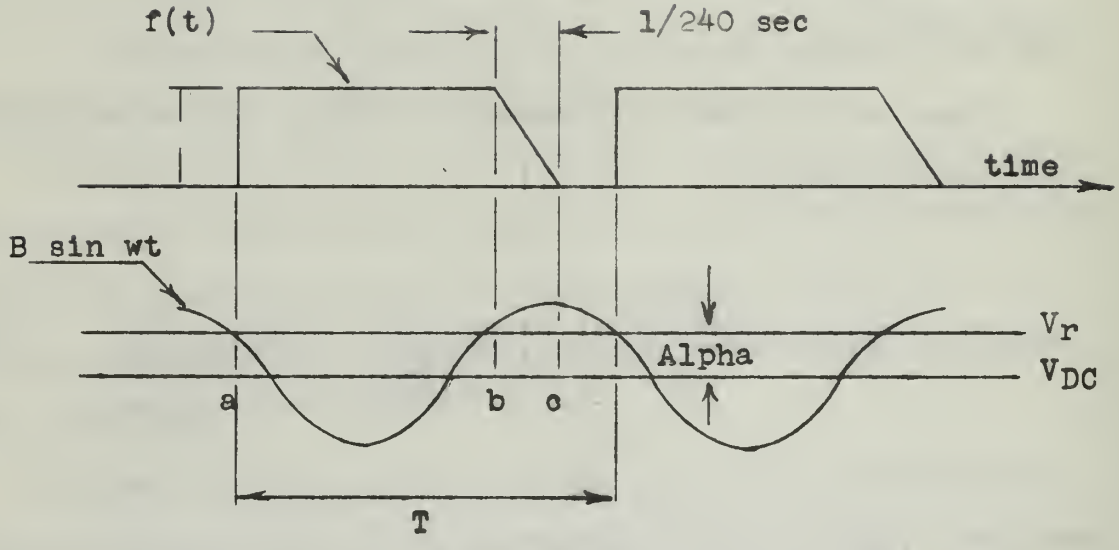


Figure 2-1

2. Development of describing function

Referring to figure 2-1, the following quantities are defined as follows.

The output of the system has a certain DC voltage level. Superimposed on this DC level is a ripple voltage, the first harmonic of which is defined as (B sin wt). A reference voltage greater than the DC level of the output is defined such that:

$$V_R - V_{DC} = \text{alpha}$$

The system is presumed to operate as follows:

a) When the DC voltage plus the ripple is less than the reference level the rectifier bridge is ON and the output of the nonlinear portion of the system is a three-phase, full-wave, rectified voltage of mean value A (time a to b).

b) When the DC voltage plus the ripple equals the reference voltage, the rectifier bridge receives an OFF signal (time b).

c) The rectifier is turned off at time equal to c, a delay of 1/240 second after time b.

d) The rectifier remains off until the output voltage again falls below the reference (time c to t)

NOTE Source voltage is considered to be 6-cycle, 3-phase, alternating current. If a supply of other frequency is considered a different time delay will be necessary in (c) above.

The output of the nonlinear block of figure 1-4 may then be summarized as follows:

$$\begin{aligned} f(t) &= 0 && 0 < t < a \\ &= A && a < t < b \\ &= A\,\frac{c-t}{c-b} && b < t < c \\ &= 0 && c < t < T \end{aligned}$$

The following times may be defined in terms of the first harmonic of the ripple:

$$B \sin \omega b = \alpha$$

$$b = \frac{\sin^{-1} \alpha/B}{\omega}$$

$$a = \frac{\pi}{\omega} - b$$

$$c = b + \frac{1}{240}$$

To find the Fourier coefficients, one proceeds as follows:

$$A_n = \frac{2}{T} \int_0^T f(t) \cos \frac{2n\pi}{T} t \, dt$$

Note that:

$$\frac{c-t}{c-b} = \frac{b + 1/200 - t}{1/240} = 240b + 1 - 240t$$

Thus:

$$A_1 = \frac{2A}{T} \left[\int_a^b \cos \omega t \, dt + 240b \int_b^c \cos \omega t \, dt + \int_b^c \cos \omega t \, dt - 240 \int_b^c t \cos \omega t \, dt \right]$$

$$= \frac{2A}{T} \left[\int_a^c \cos \omega t \, dt + 240b \int_b^c \cos \omega t \, dt - 240 \int_b^c t \cos \omega t \, dt \right]$$

Integrating and substituting the limits:

$$A_1 = \frac{2A}{T} \left[\frac{\sin \omega c}{\omega} - \frac{\sin \omega a}{\omega} + \frac{240b \sin \omega c}{\omega} - \frac{240b}{\omega} \sin \omega b \right.$$

$$\left. - \frac{240}{\omega^2} \cos \omega c - \frac{240c}{\omega} \sin \omega c + \frac{240}{\omega^2} \cos \omega b + \frac{240b}{\omega} \sin \omega b \right]$$

Cancelling terms, the above reduces to:

$$A_1 = \frac{2A}{T}\left[-\sin \omega b + \frac{240}{\omega}\left(\cos \omega b - \cos \omega c\right)\right]$$

Some useful identities are:

$$\sin \omega c = \sin \omega b + \frac{\omega}{240} = \sin \omega b \cos \frac{\omega}{240} + \cos \omega b \sin \frac{\omega}{240}$$

$$\cos \omega c = \cos \omega b + \frac{\omega}{240} = \cos \omega b \cos \frac{\omega}{240} - \sin \omega b \sin \frac{\omega}{240}$$

Thus: $$A_1 = \frac{2A}{\omega T}\left[-\sin \omega b + \frac{240}{\omega}\left(\cos \omega b - \cos \frac{\omega}{240} + \sin \omega b \sin \frac{\omega}{240}\right)\right]$$

Substituting the following values,

$$\omega T = 2\pi, \quad \sin \omega b = \frac{\alpha}{B} \quad \text{and} \quad \cos \omega b = \frac{\sqrt{B^2 - \alpha^2}}{B}$$

the final form of the A_1 term is given as equation (2-1).

$$A_1 = \frac{A}{\pi}\left[-\frac{\alpha}{B} + \frac{240}{\omega}\left(\frac{\sqrt{B^2 - \alpha^2}}{B}\left(1 - \cos \omega/240\right)\right) + \frac{\alpha}{B} \sin \frac{\omega}{240}\right]$$

$$= \frac{A}{\pi B}\left[-\alpha + \frac{240}{\omega}\left(\sqrt{B^2 - \alpha^2}\left(1 - \cos \omega/240\right) + \alpha \sin \omega/240\right)\right] \quad (2\text{-}1)$$

Proceeding in like manner to find B_1:

$$B_1 = \frac{2A}{T}\left[\int_a^c \sin \omega t \, dt + 240b\int_b^c \sin \omega t \, dt - 240\int_b^c t \sin \omega t \, dt\right]$$

$$B_1 = \frac{2A}{\omega T}\left[\cos \omega a + 240\,(\sin \omega b - \sin \omega c)\right]$$

$$\cos \omega a = \cos \pi - \omega b = -\cos \omega b$$

$$B_1 = \frac{A}{\pi}\left[-\frac{\sqrt{B^2-\alpha^2}}{B} + \frac{240}{\omega}\left(\frac{\alpha}{B}\left(1-\cos\frac{\omega}{240}\right) - \frac{\sqrt{B^2-\alpha^2}}{B}\sin\frac{\omega}{240}\right)\right]$$

$$= \frac{A}{B\pi}\left[-\sqrt{B^2-\alpha^2} + \frac{240}{\omega}\left(\alpha\left(1-\cos\frac{\omega}{240}\right) - \sqrt{B^2-\alpha^2}\sin\frac{\omega}{240}\right)\right] \quad (2-2)$$

The describing function is then:

$$N = \frac{\sqrt{A_1^2 + B_1^2}}{B} \angle \phi \qquad (2\text{-}3)$$

$$\phi = TAN^{-1} \frac{A_1}{B_1}$$

These equations, (2-1), (2-2), and (2-3) are now suitable for evaluating the numerical value of the describing function. However, due to their complex nature, the digital computer is necessary to overcome the labor required to calculate more than a limited number of points.

Since the describing function is dependent upon the frequency, the magnitude of the input, and the difference between the DC level of the output and the reference voltage, separate sets of calculations are necessary for each choice of an independent variable. For convenience the maximum value of the input is chosen as the independent variable and families of curves are obtained for constant alpha and several values of frequency. The flow chart for a computer program to accomplish this is illustrated in figure 2-2. (see next page)

The graphical display chosen for the describing function is a Nichols plot of -1/N. The utility of this choice will be shown later.

Results of the computer evaluation of the describing function for various values of alpha and frequency are shown in figures 2-3 through 2-8.

The computer program with numerical data is contained in Appendix I.

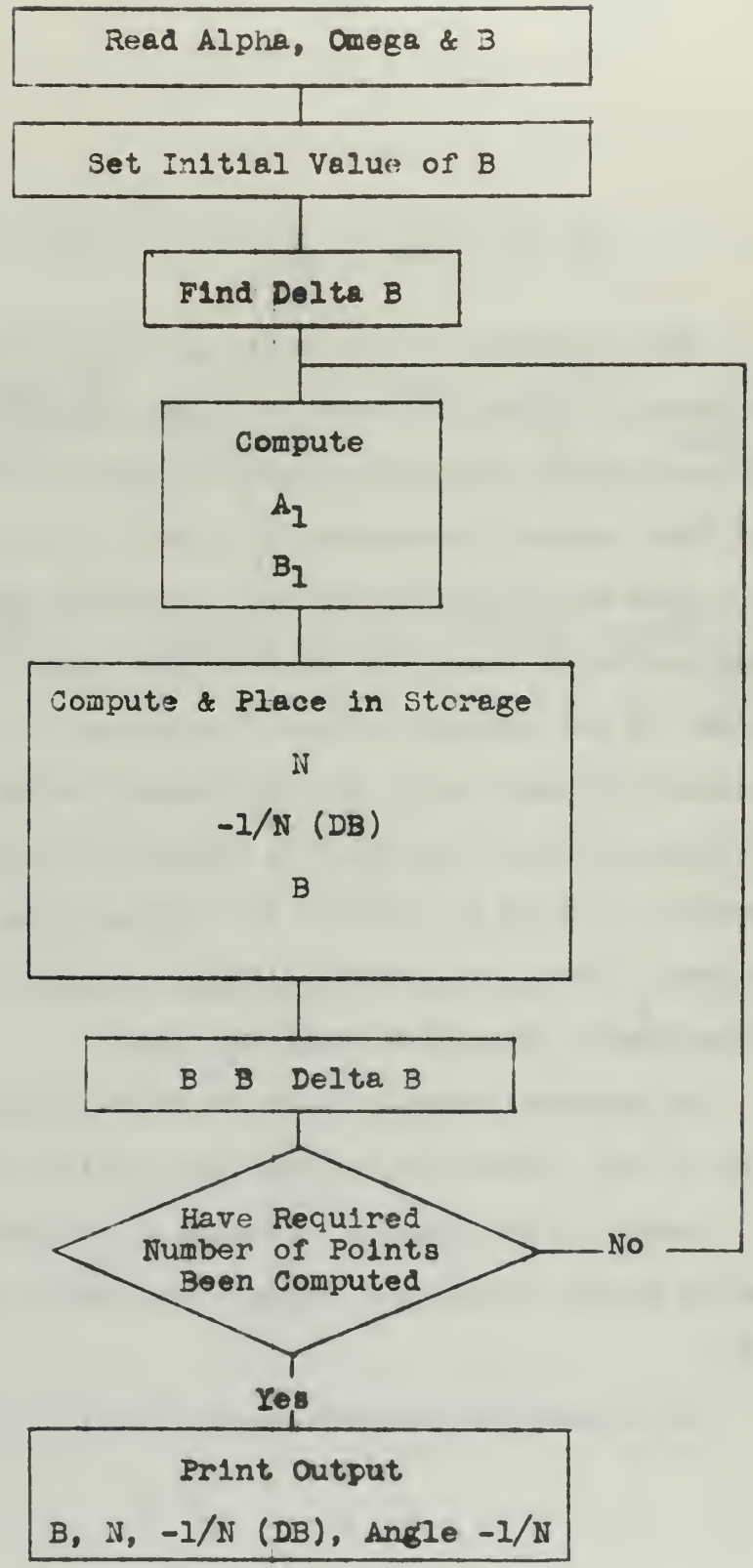


Figure 2-2

Flow Chart to Compute Value of Describing Function.

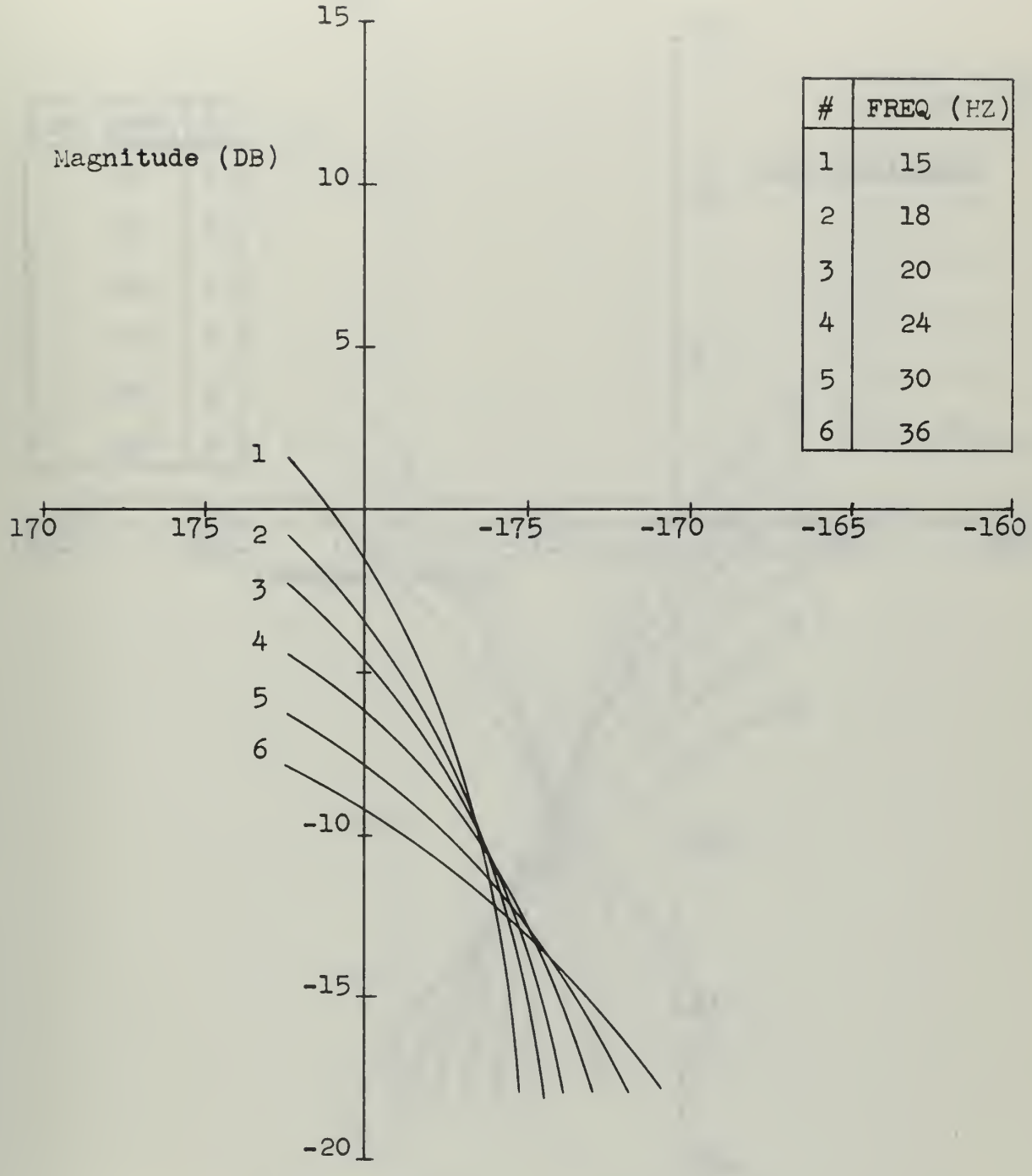


Figure 2-3

Describing Function (-1/N Alpha (1.0)

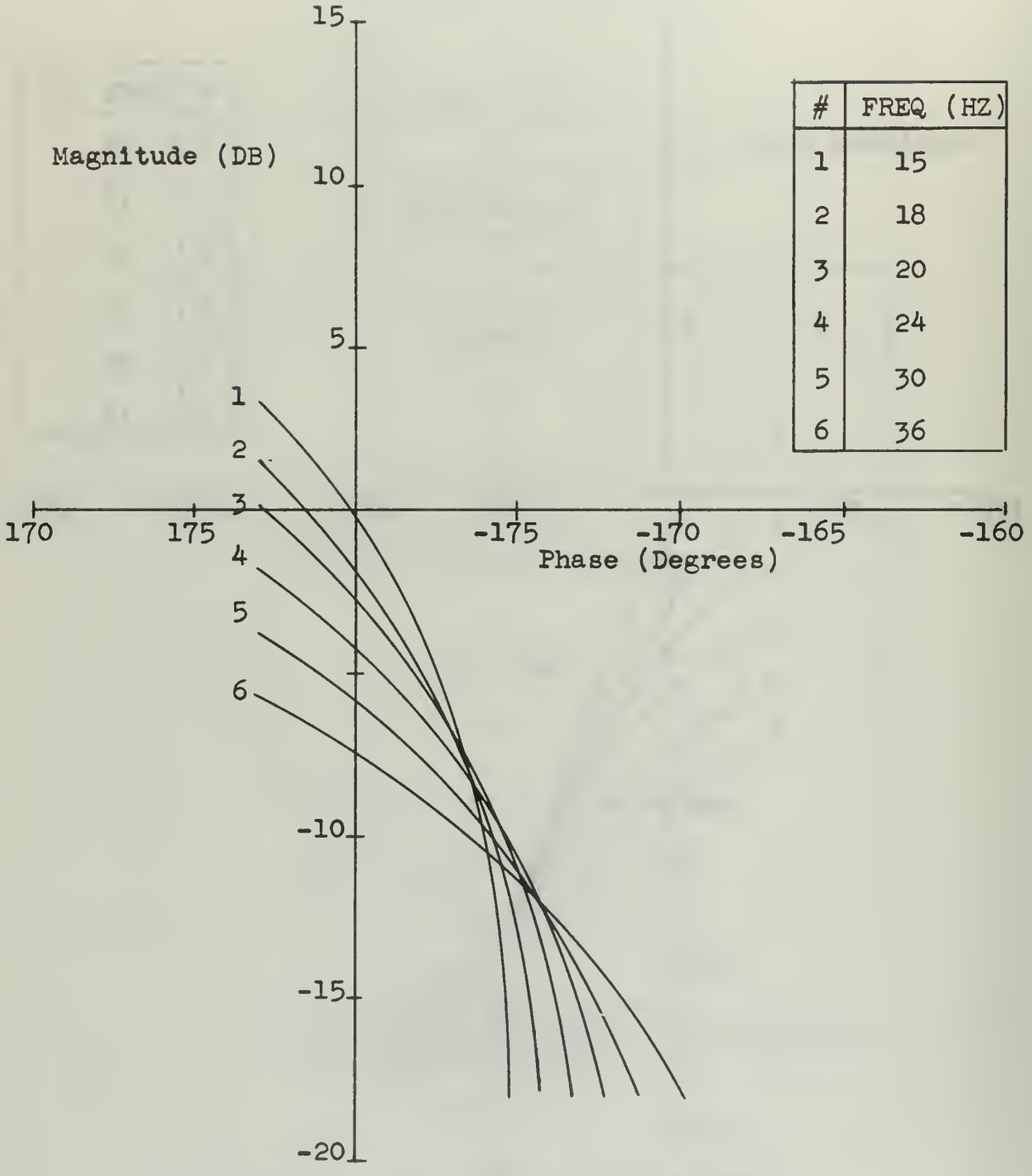


Figure 2-4

Describing Function (-1/N) Alpha (1.25)

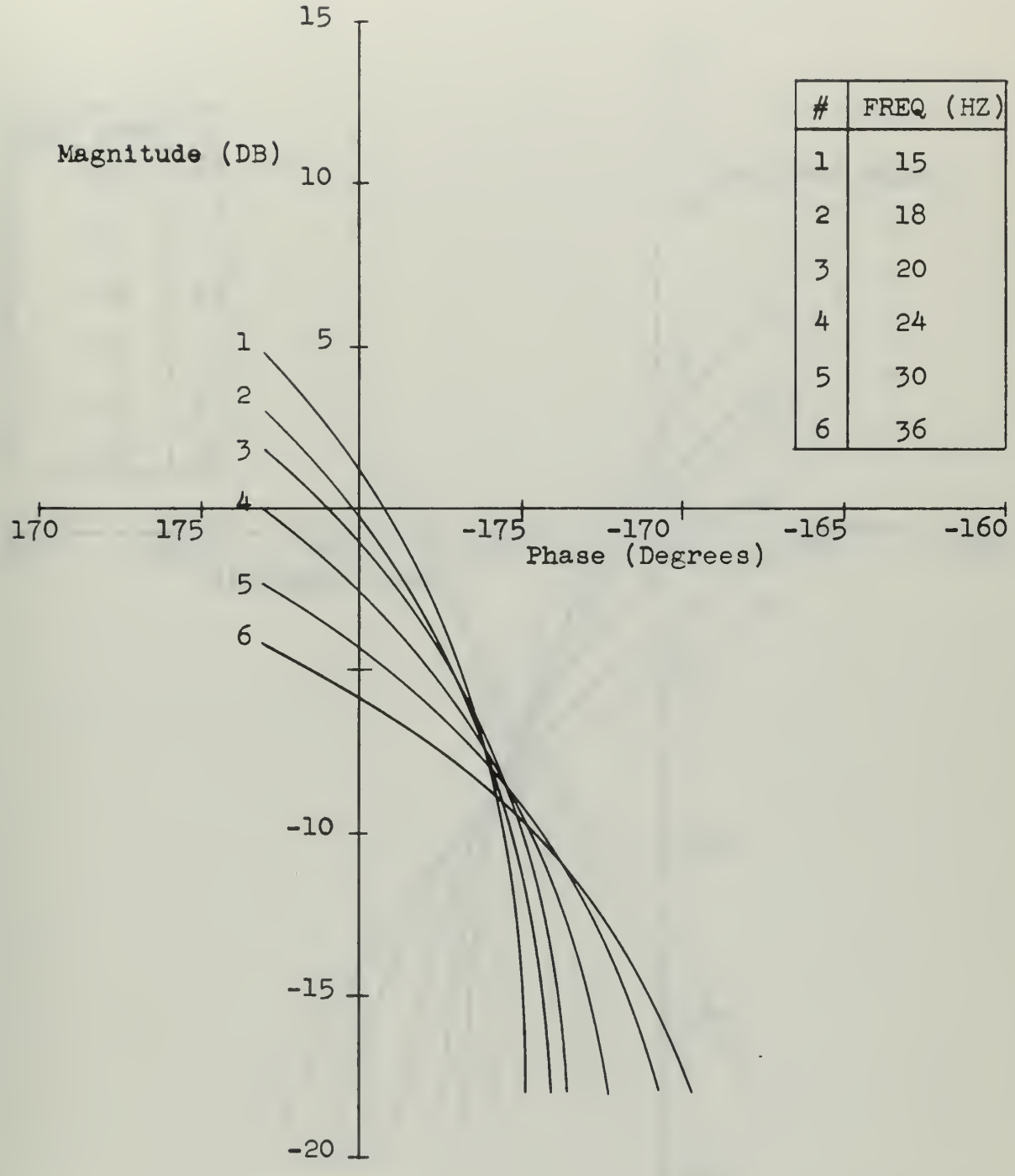


Figure 2-5

Describing Function (-1/N) Alpha (1.5)

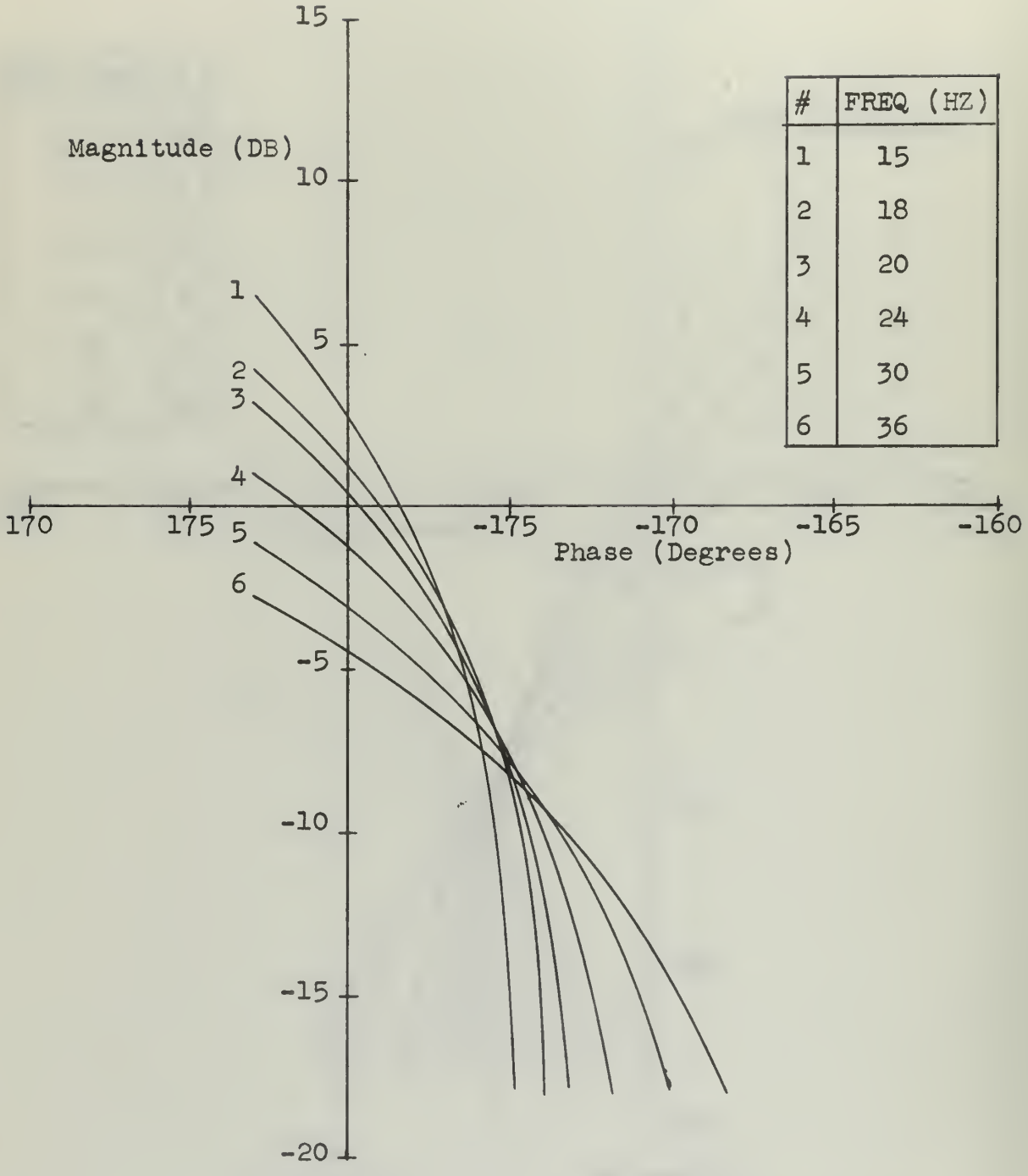


Figure 2-6

Describing Function (-1/N) Alpha (1.75)

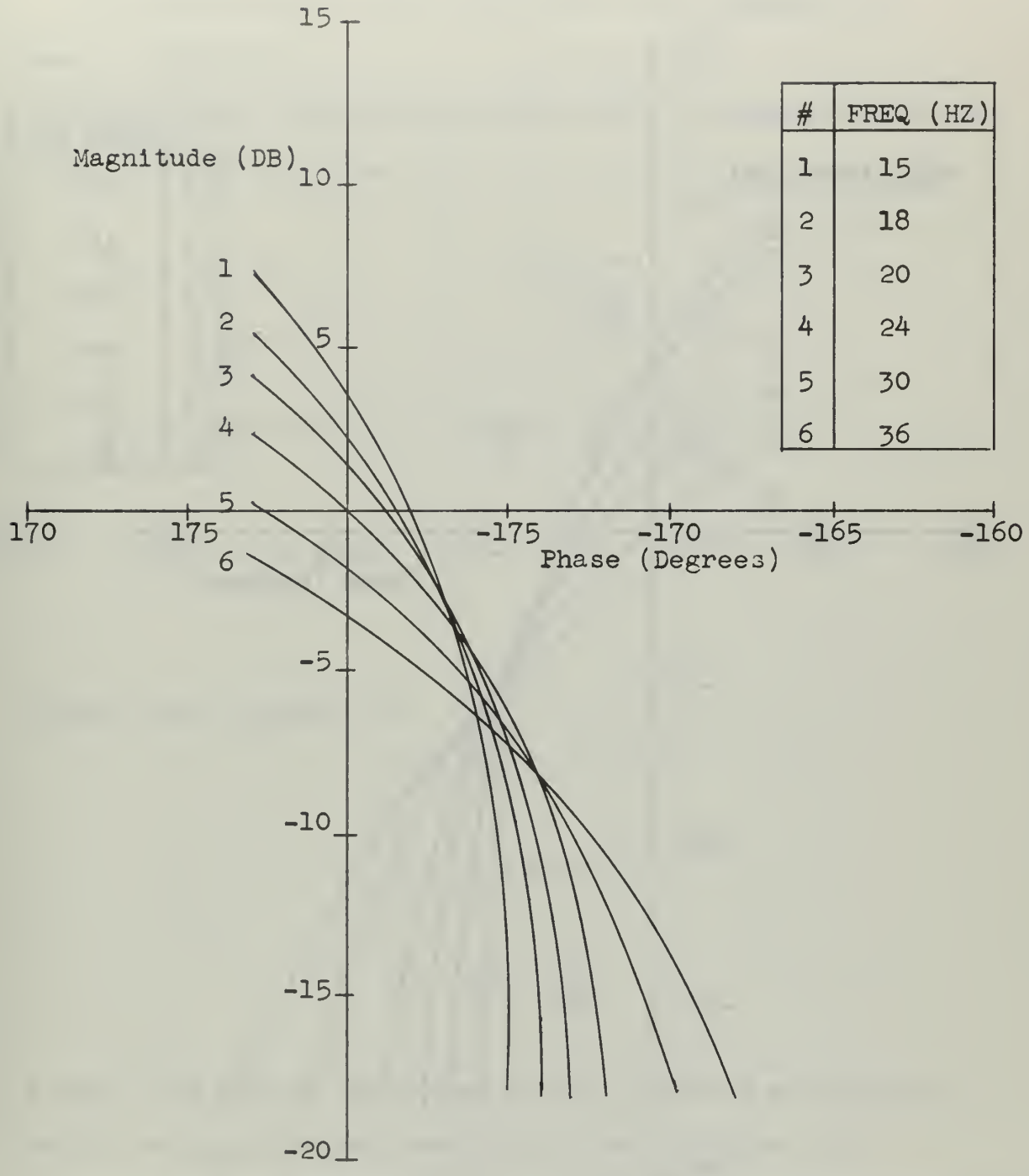


Figure 2-7

Describing Function (-1/N) Alpha (2.0)

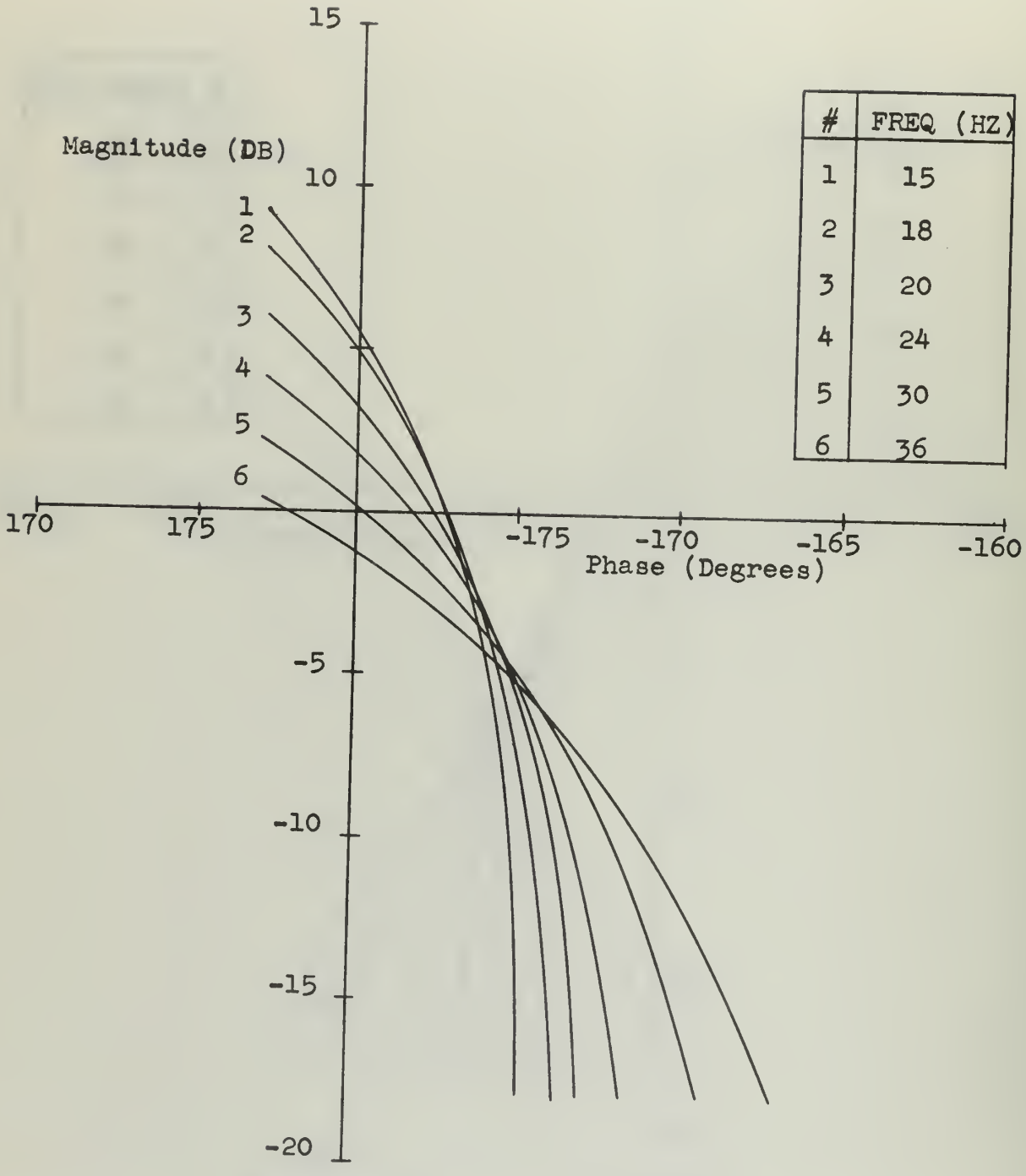


Figure 2-8

Describing Function (-1/N) Alpha (2.5)

3. Linear portion of system

The linear portion of the system may be block diagrammed as shown in figure 3-1.

The transfer function for the filter and load illustrated in figure 3-2 is developed as follows:

$$V_{IN} = V_L + V_C = L\frac{di_L}{dt} + V_C \qquad i_L = i_C + i_L = C\frac{dV_C}{dt} + \frac{V_C}{R}$$

$$\frac{di_L}{dt} = \frac{1}{L}(V_{IN} - V_C) \qquad \frac{dV_C}{dt} = \frac{i_L}{C} - \frac{V_C}{RC}$$

Note: $V_C = V_O$

Choosing state variables as:

$$X_1 = V_O$$
$$X_2 = i_L$$
$$\dot{X}_2 = \frac{1}{L}(V_{IN} - X_1)$$

$$\dot{X}_1 = \frac{X_2}{C} - \frac{X_1}{RC}$$

A signal flow graph of the system, with 1/S indicating an integration and X_{10} and X_{20} as initial condition, is given in figure 3-3.

Using Mason's gain rule the transfer function in Laplace notation is:

$$\frac{V_O}{V_{IN}} = \frac{\frac{1}{LC}}{S^2 + \frac{R}{C}S + \frac{1}{LC}}$$

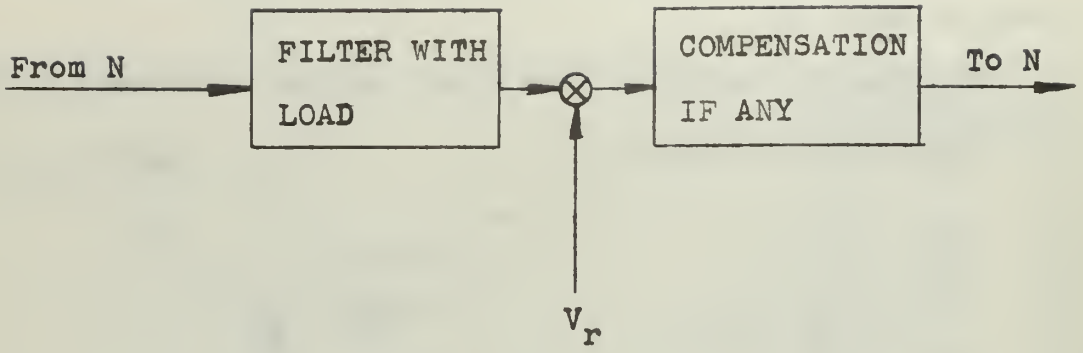


Figure 3-1

Block Diagram for Linear System.

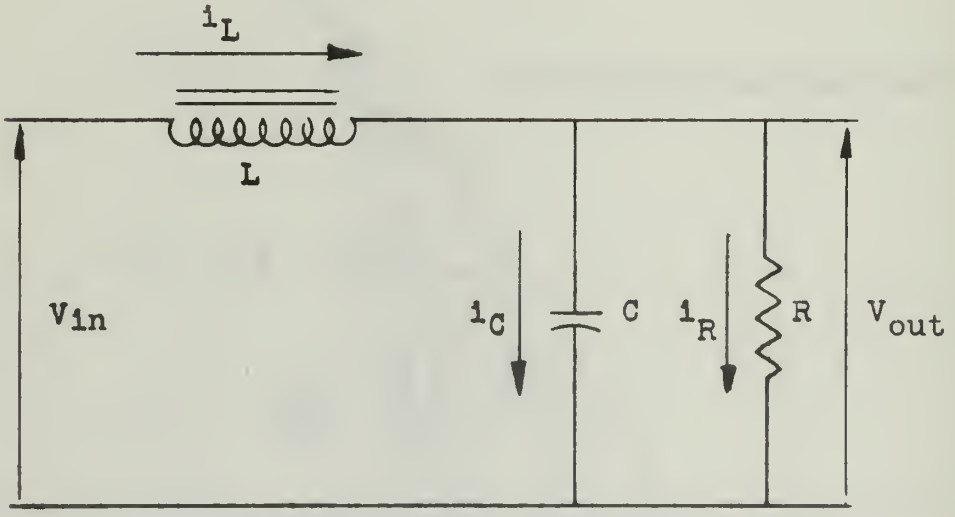


Figure 3-2

Filter and Load.

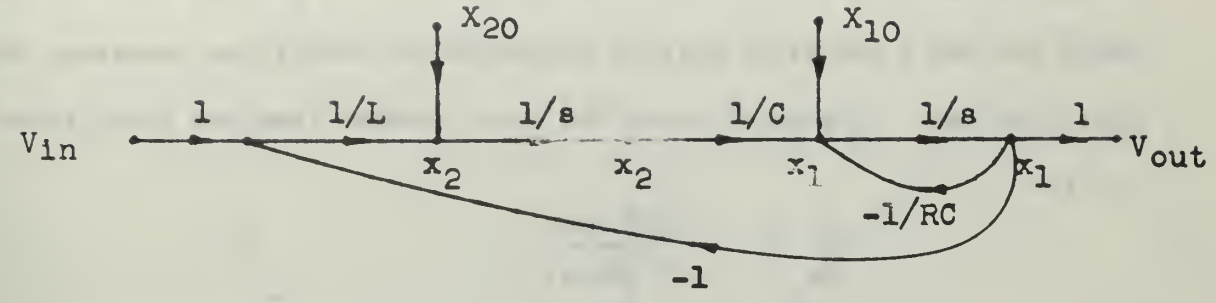


Figure 3-3

Signal Flow Graph for Linear System.

Or in Bode form:

$$\frac{V_o}{V_{IN}} = \frac{1}{LC\,S^2 + \frac{R}{L}S + 1}$$

Having derived the transfer function for the linear portion of the system there are now a number of ways to determine the conditions necessary for limit cycling. In general terms the loop transfer function from figure 1-3 is:

$$\frac{V_o}{V_r} = \frac{NG_1G_2}{1 + NG_1G_2}$$

The characteristic equation for the system is then:

$$1 + NG_1G_2 = 0$$

This can be rearranged as:

$$G_1G_2 = G = -1/N$$

Thus the intersection of a graphical representation of G with -1/N determines the critical point at which limit cycling will occur, if such an intersection exists. Either a Nyquist or a Nichols plot is convenient for this. The choice of the Nichols plot for this analysis is arbitrary; however it does have some merit in that it is closely related to the Bode plot on which the linear system can easily be drawn, and on which the effects of compensation are probably more familiar.

Numerical values for the circuit elements are:

L = 0.002 henries

C = 0.1 farads

R = 0.8, 1.6, and 3.2 ohms

The values of L, C, and a load resistance of 1.6 ohms were chosen to coincide with other investigations being made on the performance of this system. Frequency response curves plotted on a Nichols [3], [5], display are illustrated in figure 3-4.

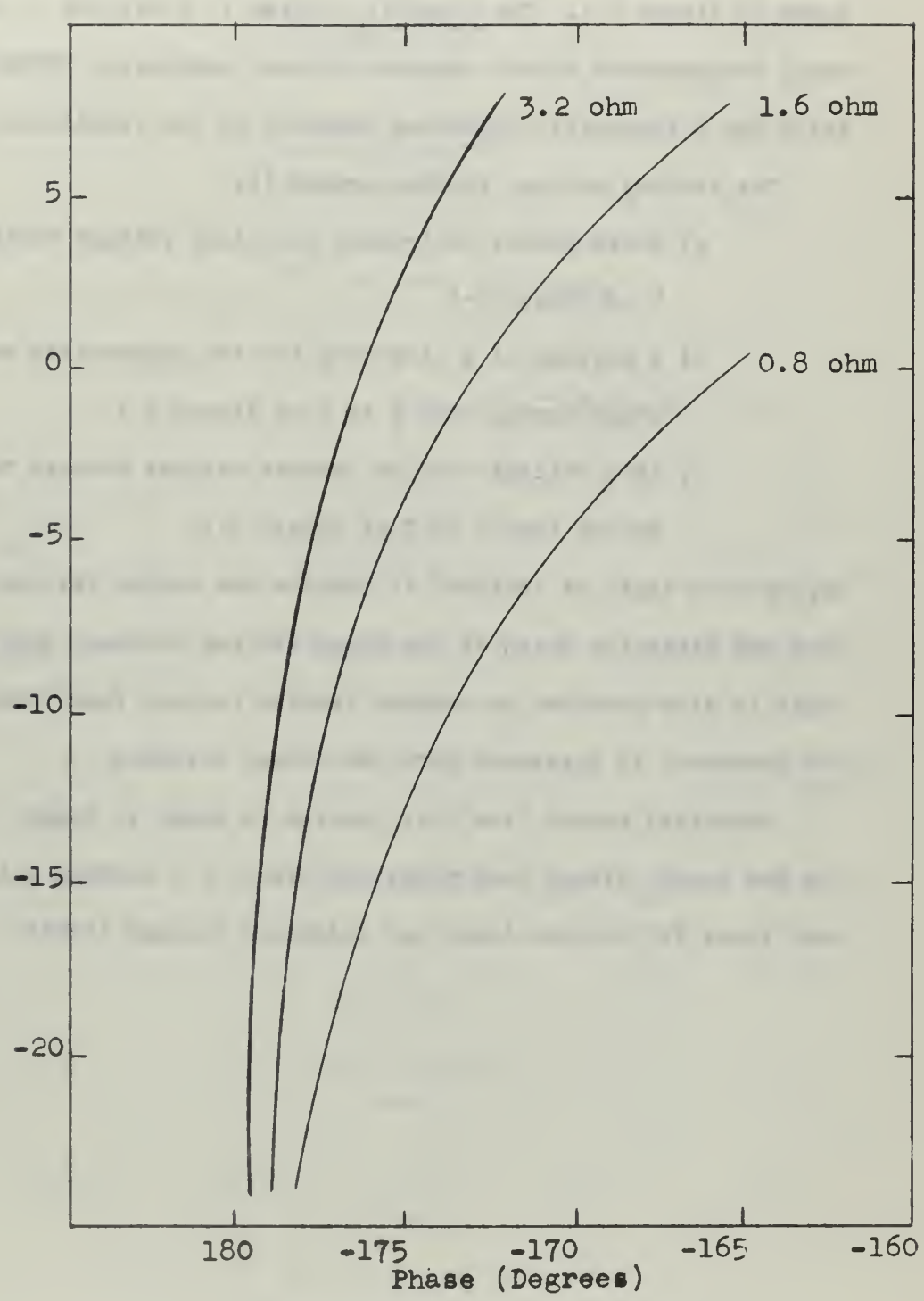


Figure 3-4

Frequency Response Curves Linear System.

4. Simulation

To determine the validity of the describing function, the system was simulated on the digital computer. The flow chart for the simulation is shown in figure 4-1. The complete program is contained in appendix II. Naval Postgraduate School computer library subroutine INTEG2 was used to solve the differential equations required in the simulation.

The forcing voltage for the system is:

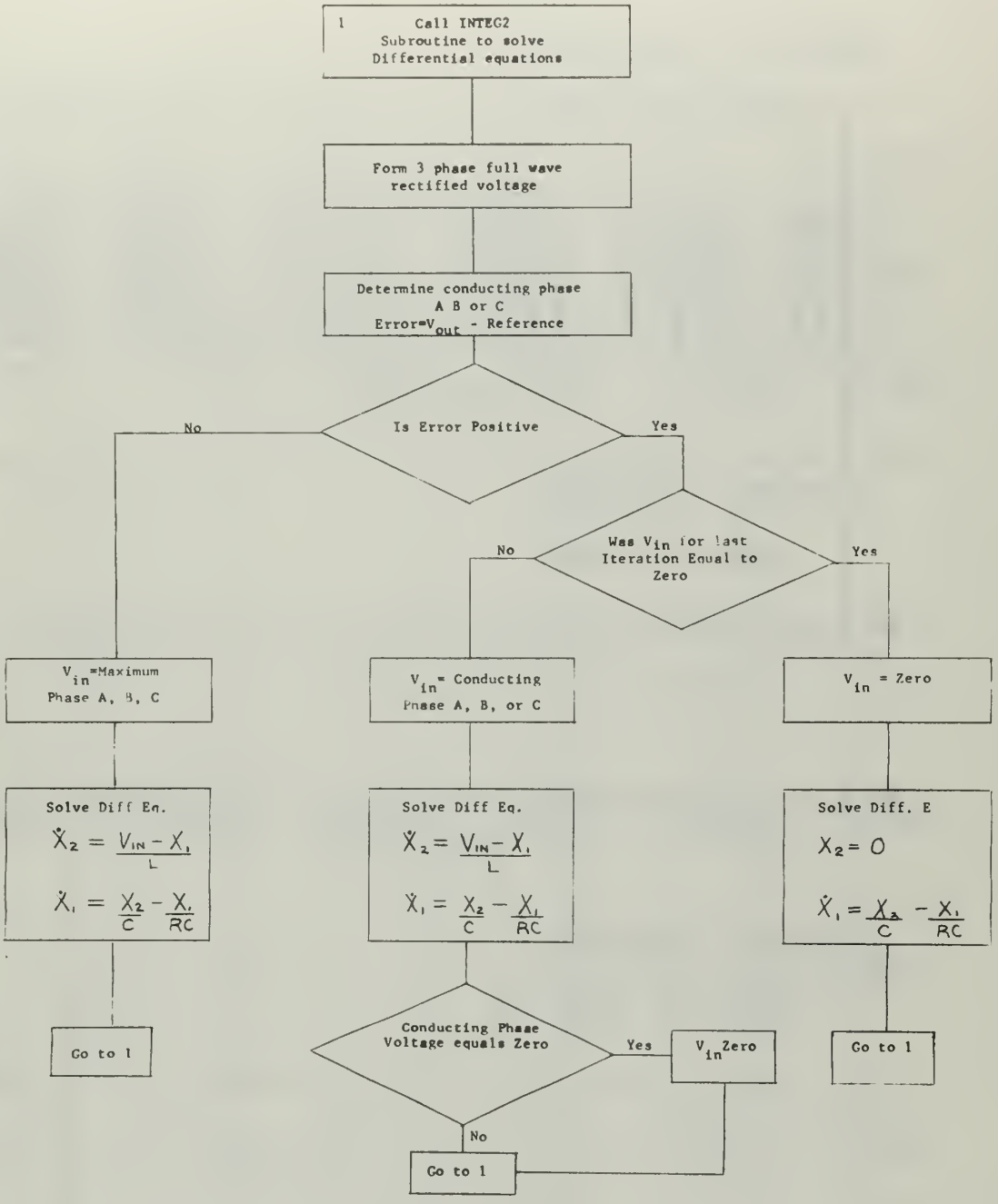
a) Three-phase, full-wave, rectified voltage during time a to b of figure 2-1.

b) A portion of a sine wave for the appropriate conducting phase during time b to c of figure 2-1.

c) Zero voltage with no reverse current through the inductance during time c to T of figure 2-1.

Appropriate logic is included to compare the output voltage to the reference and determine which of the above forcing voltages apply. Additional logic is also provided to prevent reverse current from flowing through the inductor, in agreement with the actual circuit.

Graphical output from this program is shown in figure 4-2 illustrating the input voltage wave form, and figure 4-3 showing output voltage wave forms for various loads and reference voltage levels.



Flow Chart for Simulation

Figure 4-10

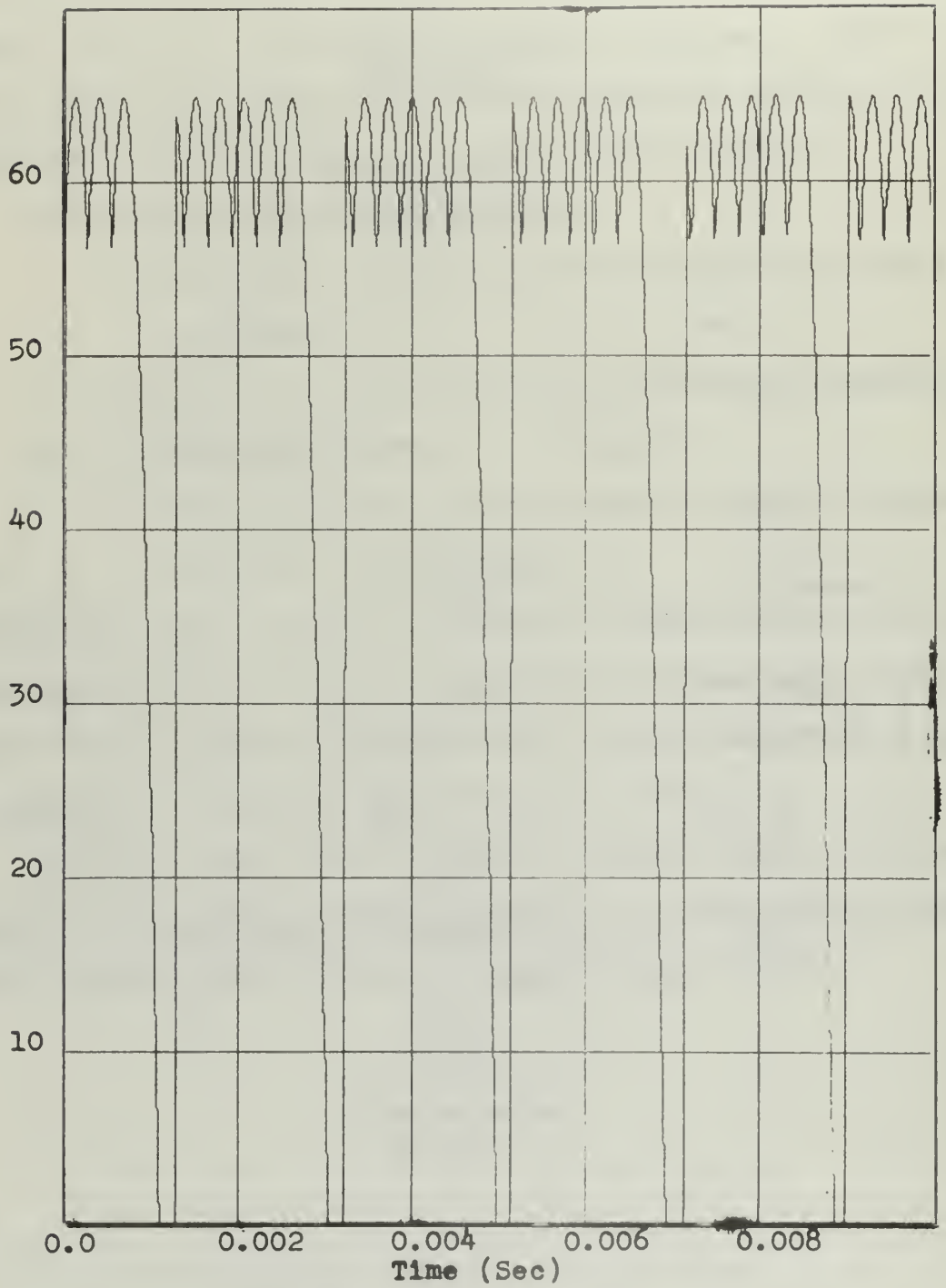
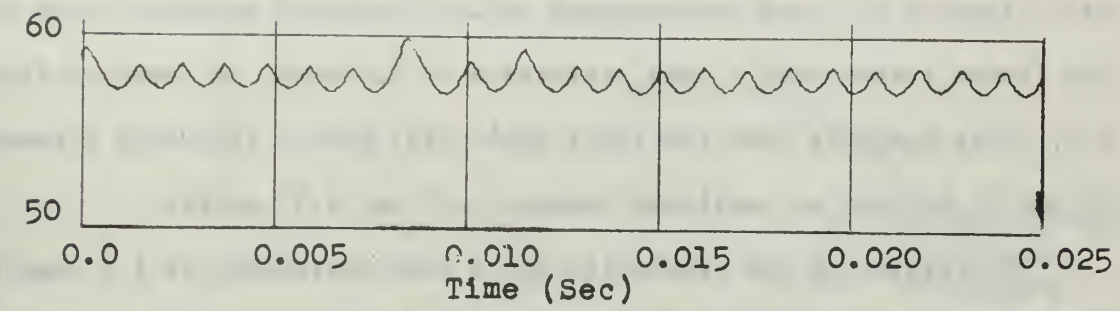


Figure 4-2

Simulation Results, Input Voltage.

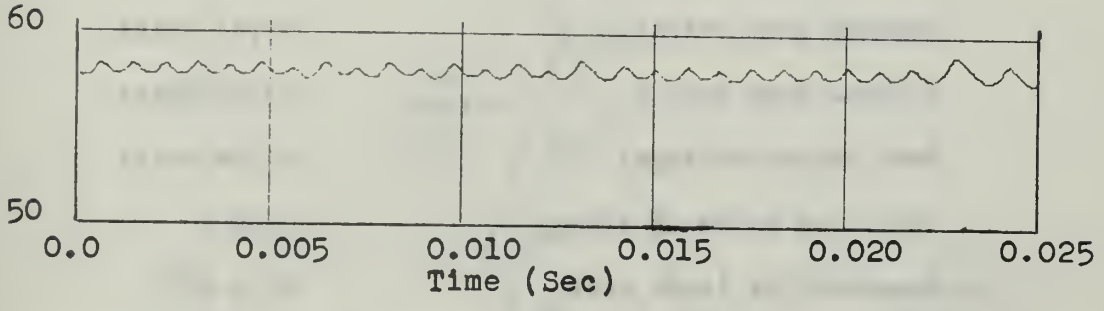
Reference 58 Volts

Load 1.6 Ohms



Reference 58 Volts

Load 3.2 Ohms



Reference 60 Volts

Load 1.6 Ohms

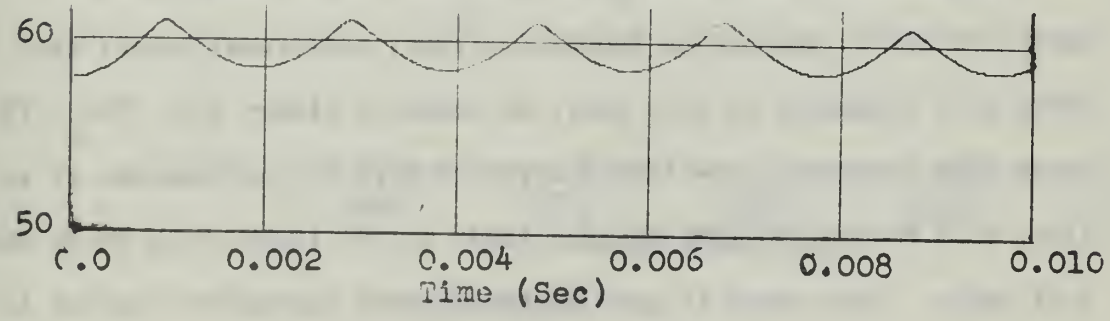


Figure 4-3

Simulation Results, Output Voltage.

5. Analysis

To illustrate the application of the describing function, curves for a frequency of 18 hz., with alpha of 2.5, and for a frequency 24 hz. with alpha of 1.0, are superimposed on the frequency response curve for the linear system with a load resistance of 1.6 ohms, as shown in figure 5-1. This predicts that the limit cycle will have a frequency between 18 and 24 hz. and an amplitude between 1.03 and 2.57 volts.

The results of the simulation for a load resistance of 1.6 ohms are given below. The complete data is contained in appendix II.

Source voltage maximum	65 volts (AC)
Reference voltage	58 volts
Maximum mean output	59.57 volts
Minimum mean output	55.39 volts
Mean output voltage	57.06 volts
Indicated value of alpha	.939
Frequency of limit cycle	22.6 hz.

The value of alpha for the simulation is taken to be the difference between the mean level of the output and the reference voltage.

To determine more exactly the location of the limit cycle as predicted by the describing function curves, additional curves were drawn at a frequency of 22.6 haz., as shown in figure 5-2. The -1/N curve that intersects the linear curve at 22.6 hz. corresponds to an alpha of 0.8 and indicates the amplitude of the limit cycle to be about 0.82 volts. Thus there is good agreement with simulation results in both the frequency of the limit cycle and the value of alpha predicted by the describing function. This indicates the validity of the describing function in predicting the response of the nonlinear portion of the system.

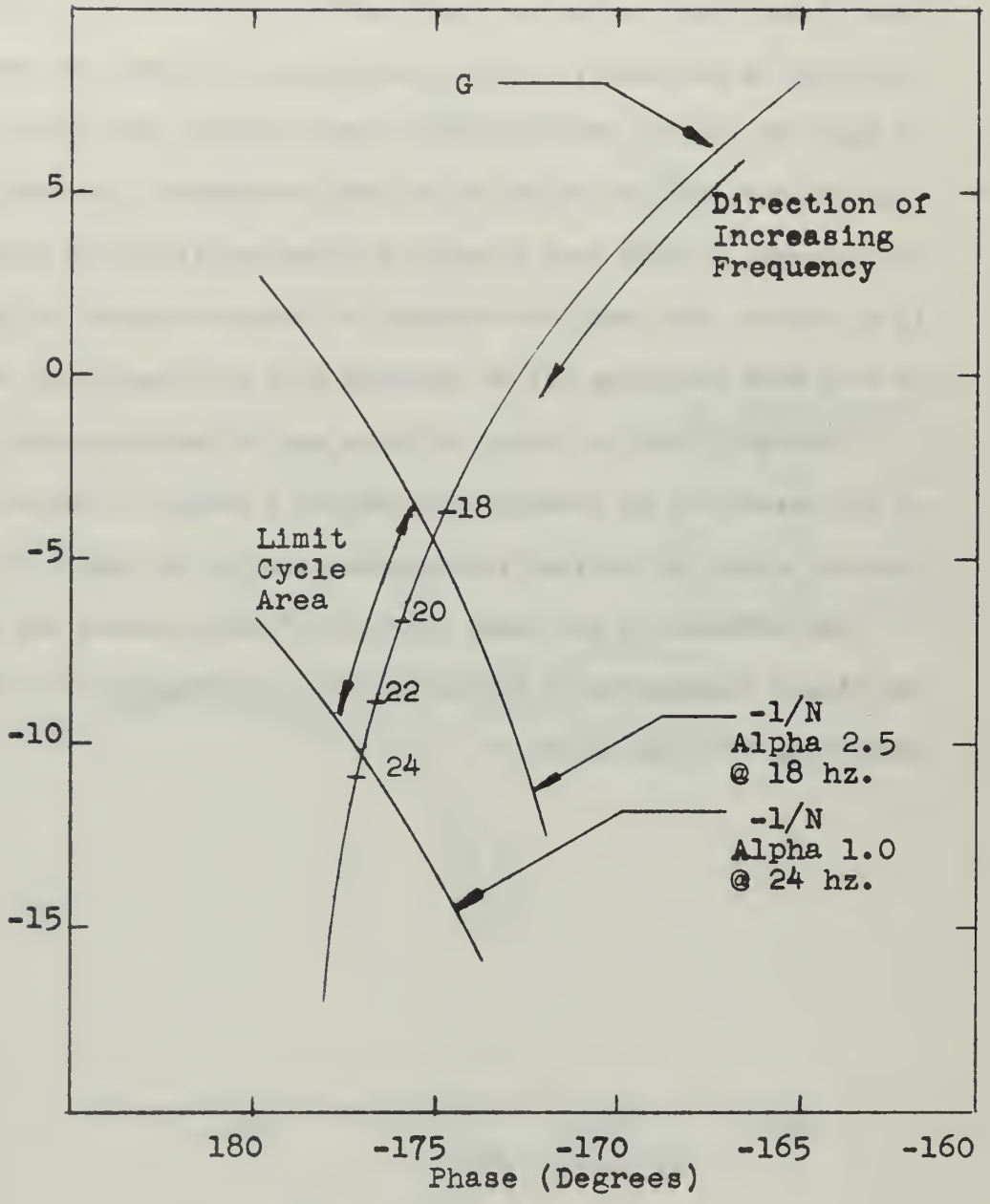


Figure 5-1

Describing Function (-1/N) Superimposed on Linear Response (G).

In order to make full use of the describing function one should be able to use the appropriate curves to pre-determine the response of the system. However, to obtain more than a general indication of the location of the limit cycle, as illustrated in figure 5-2, a precise value for alpha is necessary. Indications from simulations are that the value of alpha is related to the maximum input voltage, the level of the reference voltage, and the value of the load resistance. However, no means are apparent at this time by which a relationship can be obtained. This is a question that should be studied in future research on this system, so that full advantage may be obtained from the describing function.

Presuming that the value of alpha can be predetermined, the response of the system can be predicted by drawing a family of curves using that value of alpha and various frequencies, similar to figure 2-3.

The location of the limit cycle will then be where the frequency of the linear response curve corresponds to the frequency of one of the describing function curves.

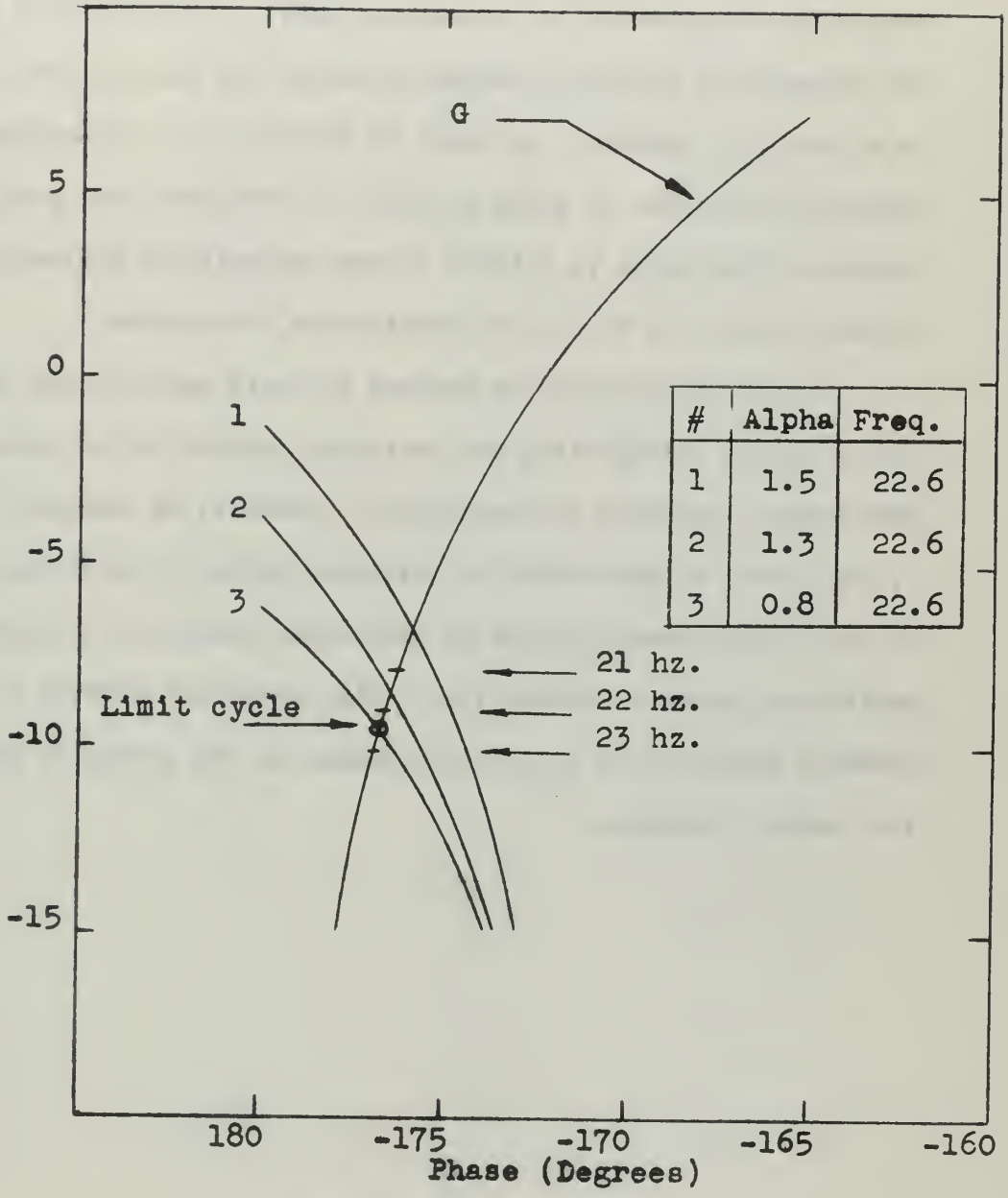


Figure 5-2

Location of Limit Cycle

6. Conclusions and recommendations for further work.

The describing function derived in Section 2 provides a means by which the nonlinear portion of this system can be represented and the overall performance of the system analyzed. It is possible to predict the approximate frequency and amplitude of the limit cycle as illustrated in Figure 5-1. However, as noted in Section 5, it is necessary to predetermine the value of alpha in order to more precisely predict the response. How alpha is related to the controllable parameters of the system is one area for future research on this system.

The describing function derived accounts only for the first harmonic of the output voltage from the nonlinear portion of the system and assumes that higher harmonics are negligible. However, as reported in Reference 1, the output voltage from the thyristor bridge is such that sub-multiples of the first harmonic can be of sufficient magnitude to introduce an additional degree of instability. The nature and effects of these subharmonic oscillations on the performance of the system is another area for further research.

APPENDIX I

Computer Program for computing value of describing function curves. Numerical data for -1/N curves plotted in Figures 2-3 through 2-8 and for Figures 5-1 and 5-2.

```
      DIMENSION X(1500),Y(1500),Z(1500),YY(1500)
  100 FORMAT(2F10.5,I2,A4)
  101 FORMAT(1H1,//,124,'DESCRIBING FUNCTION DATA',/)
  102 FORMAT(14X,F6.4,7X,F7.4,7X,F7.2,6X,F8.4)
  107 FORMAT(T19,'B',T31,'N',T42,'PHASE',T56,'-1/N(DB)',//)
  402 FORMAT(T24,'ALPHA = ',F4.2,//)
  401 FORMAT(T24,'FREQUENCY = ',F5.1,//)
  202 READ (5,100)ALPHA,FREQ,MOD,LAB
      IF(ALPHA.GT.50.) GO TO 304
      PI=3.141592
      T=1.0/FREQ
      C5=ALPHA
      XPHI=3.*FREQ/(4.*57.29578)
      XRAN=C5*((1.1/COS(XPHI))-1.)
      XINC=XRAN/50.
      B=C5+XINC
      C3=PI/(120.*T)
      DO 200 J=1,50
      NPT=J
      XJ=J
      C1=1./(B*PI)
      DCG=B**2-C5**2
      IF(DCG)300,300,301
  300 C2=0.0
      GO TO 302
  301 C2=SQRT(DCG)
  302 CONTINUE
      A1=C1*(-C5+(1./C3)*(+C2-C2*COS(C3)+C5*SIN(C3)))
      B1=C1*(-C2+(1./C3)*(C5*(1.-COS(C3))-C2*SIN(C3)))
      X(J)=B
      Y(J)=(SQRT(A1**2+B1**2))*62./B
      Z(J)=57.29578*ATAN2(A1,B1)
      YY(J)=20.0*(ALOG10(Y(J)))
      Z(J)=-Z(J)
      YY(J)=-YY(J)
      B=B+XINC
  200 CONTINUE
      WRITE(6,101)
      WRITE(6,401)FREQ
      WRITE(6,402)ALPHA
      WRITE(6,107)
      DO 201  J=1,50
  201 WRITE(6,102)X(J),Y(J),Z(J),YY(J)
      GO TO 202
  304 CONTINUE
      STOP
      END
```

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 1.CC

B	N	PHASE	-1/N(DB)
1.0024	1.1263	12.06	-1.0330
1.0049	0.1263	99.73	17.9733
1.0073	0.8772	177.39	1.1385
1.0097	1.591C	-178.89	-4.0336
1.0122	2.2162	-177.60	-6.9120
1.0146	2.7766	-176.94	-8.8703
1.0170	3.2870	-176.54	-10.3361
1.0194	3.7575	-176.26	-11.4980
1.0219	4.1949	-176.06	-12.4544
1.0243	4.6044	-175.90	-13.2634
1.0267	4.9898	-175.78	-13.9617
1.0292	5.3542	-175.68	-14.5740
1.0316	5.7001	-175.59	-15.1176
1.0340	6.0292	-175.52	-15.6052
1.0365	6.3434	-175.46	-16.0465
1.0389	6.6440	-175.41	-16.4486
1.0413	6.9322	-175.36	-16.8174
1.0438	7.2089	-175.32	-17.1574
1.0462	7.4751	-175.28	-17.4723
1.0486	7.7315	-175.25	-17.7652
1.0510	7.9788	-175.22	-18.0387
1.0535	8.2175	-175.19	-18.2948
1.0559	8.4483	-175.17	-18.5354
1.0583	8.6716	-175.14	-18.7620
1.0608	8.8878	-175.12	-18.9758
1.0632	9.0973	-175.10	-19.1782
1.0656	9.3005	-175.08	-19.3701
1.0681	9.4976	-175.07	-19.5523
1.0705	9.6891	-175.05	-19.7257
1.0729	9.8751	-175.03	-19.8909
1.0754	10.056C	-175.02	-20.0485
1.0778	10.2319	-175.01	-20.1991
1.0802	10.4030	-174.99	-20.3432
1.0827	10.5697	-174.98	-20.4812
1.0851	10.7319	-174.97	-20.6136
1.0875	10.8901	-174.96	-20.7406
1.0899	11.0441	-174.95	-20.8626
1.0924	11.1944	-174.94	-20.9800
1.0948	11.3409	-174.93	-21.0929
1.0972	11.4839	-174.92	-21.2017
1.0997	11.6234	-174.91	-21.3066
1.1021	11.7595	-174.90	-21.4078
1.1045	11.8925	-174.90	-21.5054
1.1070	12.0223	-174.89	-21.5997
1.1094	12.1491	-174.88	-21.6909
1.1118	12.2730	-174.87	-21.7790
1.1143	12.3941	-174.87	-21.8643
1.1167	12.5125	-174.86	-21.9469
1.1191	12.6282	-174.85	-22.0268
1.1215	12.7414	-174.85	-22.1043

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 1.CC

B	N	PHASE	-1/N(DB)
1.0026	1.7892	12.57	-5.0532
1.0052	0.6352	23.32	3.9425
1.0079	0.3360	154.22	9.4725
1.0105	1.0443	176.82	-0.3763
1.0131	1.6887	-179.35	-4.5512
1.0157	2.2687	-177.78	-7.1154
1.0184	2.7973	-176.91	-8.9348
1.0210	3.2848	-176.35	-10.3301
1.0236	3.7380	-175.97	-11.4527
1.0262	4.1621	-175.68	-12.3861
1.0289	4.5611	-175.46	-13.1814
1.0315	4.9383	-175.28	-13.8716
1.0341	5.2961	-175.14	-14.4790
1.0367	5.6365	-175.02	-15.0202
1.0394	5.9613	-174.91	-15.5068
1.0420	6.2719	-174.82	-15.9479
1.0446	6.5694	-174.75	-16.3505
1.0472	6.8550	-174.68	-16.7202
1.0499	7.1296	-174.62	-17.0613
1.0525	7.3940	-174.56	-17.3775
1.0551	7.6488	-174.52	-17.6718
1.0577	7.8946	-174.47	-17.9466
1.0604	8.1321	-174.43	-18.2041
1.0630	8.3618	-174.39	-18.4460
1.0656	8.5841	-174.36	-18.6739
1.0682	8.7993	-174.33	-18.8890
1.0709	9.0080	-174.30	-19.0925
1.0735	9.2103	-174.27	-19.2855
1.0761	9.4067	-174.25	-19.4687
1.0787	9.5973	-174.22	-19.6430
1.0814	9.7825	-174.20	-19.8090
1.0840	9.9626	-174.18	-19.9675
1.0866	10.1377	-174.16	-20.1187
1.0892	10.3080	-174.14	-20.2635
1.0919	10.4738	-174.12	-20.4021
1.0945	10.6352	-174.11	-20.5349
1.0971	10.7924	-174.09	-20.6624
1.0997	10.9456	-174.08	-20.7848
1.1024	11.0949	-174.06	-20.9024
1.1050	11.2405	-174.05	-21.0157
1.1076	11.3824	-174.03	-21.1246
1.1102	11.5208	-174.02	-21.2297
1.1129	11.6559	-174.01	-21.3309
1.1155	11.7878	-174.00	-21.4286
1.1181	11.9164	-173.99	-21.5229
1.1207	12.0421	-173.98	-21.6140
1.1234	12.1648	-173.97	-21.7021
1.1260	12.2846	-173.96	-21.7872
1.1286	12.4017	-173.95	-21.8696
1.1312	12.5161	-173.94	-21.9494

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 1.0C

B	N	PHASE	-1/N(DB)
1.0028	2.2208	13.28	-6.9301
1.0056	1.0307	20.02	-0.2626
1.0083	0.2402	75.54	12.3869
1.0111	0.7116	169.31	2.9554
1.0139	1.3623	178.14	-2.6854
1.0167	1.9548	-178.98	-5.8219
1.0194	2.4962	-177.55	-7.9457
1.0222	2.9957	-176.69	-9.5301
1.0250	3.4602	-176.12	-10.7821
1.0278	3.8949	-175.70	-11.8099
1.0305	4.3038	-175.39	-12.6771
1.0333	4.6901	-175.14	-13.4237
1.0361	5.0565	-174.94	-14.0771
1.0389	5.4050	-174.77	-14.6560
1.0416	5.7374	-174.63	-15.1744
1.0444	6.0551	-174.51	-15.6424
1.0472	6.3593	-174.41	-16.0682
1.0500	6.6513	-174.31	-16.4581
1.0527	6.9318	-174.23	-16.8169
1.0555	7.2017	-174.16	-17.1487
1.0583	7.4618	-174.10	-17.4569
1.0611	7.7127	-174.04	-17.7441
1.0638	7.9549	-173.99	-18.0127
1.0666	8.1890	-173.94	-18.2646
1.0694	8.4154	-173.89	-18.5015
1.0722	8.6346	-173.85	-18.7248
1.0749	8.8469	-173.81	-18.9358
1.0777	9.0528	-173.78	-19.1356
1.0805	9.2524	-173.75	-19.3251
1.0833	9.4462	-173.71	-19.5051
1.0860	9.6343	-173.69	-19.6764
1.0888	9.8171	-173.66	-19.8396
1.0916	9.9947	-173.63	-19.9954
1.0944	10.1675	-173.61	-20.1442
1.0971	10.3355	-173.59	-20.2866
1.0999	10.4990	-173.57	-20.4230
1.1027	10.6582	-173.55	-20.5537
1.1055	10.8132	-173.53	-20.6791
1.1082	10.9642	-173.51	-20.7996
1.1110	11.1114	-173.49	-20.9153
1.1138	11.2548	-173.47	-21.0267
1.1166	11.3945	-173.46	-21.1339
1.1193	11.5309	-173.44	-21.2372
1.1221	11.6638	-173.43	-21.3368
1.1249	11.7936	-173.41	-21.4329
1.1277	11.9202	-173.40	-21.5256
1.1304	12.0437	-173.39	-21.6152
1.1332	12.1643	-173.37	-21.7017
1.1360	12.2821	-173.36	-21.7854
1.1388	12.3970	-173.35	-21.8663

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 1.00

B	N	PHASE	-1/N(DB)
1.0031	3.0593	15.02	-9.7126
1.0063	1.7962	19.28	-5.0872
1.0094	0.8582	30.89	1.3284
1.0125	0.3194	101.68	9.9136
1.0157	0.7894	165.25	2.0535
1.0188	1.3920	175.84	-2.8727
1.0219	1.9565	179.71	-5.8298
1.0251	2.4805	-178.28	-7.8910
1.0282	2.9686	-177.06	-9.4512
1.0313	3.4256	-176.23	-10.6948
1.0345	3.8555	-175.62	-11.7216
1.0376	4.2615	-175.16	-12.5912
1.0407	4.6462	-174.80	-13.3420
1.0438	5.0118	-174.51	-13.9999
1.0470	5.3603	-174.27	-14.5837
1.0501	5.6930	-174.06	-15.1068
1.0532	6.0114	-173.89	-15.5794
1.0564	6.3165	-173.73	-16.0095
1.0595	6.6094	-173.60	-16.4032
1.0626	6.8910	-173.48	-16.7656
1.0658	7.1619	-173.38	-17.1006
1.0689	7.4230	-173.29	-17.4115
1.0720	7.6748	-173.20	-17.7013
1.0752	7.9179	-173.12	-17.9721
1.0783	8.1527	-173.05	-18.2260
1.0814	8.3797	-172.99	-18.4646
1.0846	8.5994	-172.93	-18.6894
1.0877	8.8121	-172.87	-18.9016
1.0908	9.0182	-172.82	-19.1024
1.0940	9.2179	-172.77	-19.2926
1.0971	9.4116	-172.73	-19.4733
1.1002	9.5996	-172.69	-19.6450
1.1034	9.7820	-172.65	-19.8086
1.1065	9.9592	-172.61	-19.9645
1.1096	10.1313	-172.58	-20.1133
1.1127	10.2986	-172.54	-20.2556
1.1159	10.4613	-172.51	-20.3917
1.1190	10.6194	-172.48	-20.5220
1.1221	10.7733	-172.46	-20.6469
1.1253	10.9230	-172.43	-20.7668
1.1284	11.0687	-172.40	-20.8819
1.1315	11.2106	-172.38	-20.9926
1.1347	11.3488	-172.36	-21.0990
1.1378	11.4833	-172.34	-21.2013
1.1409	11.6145	-172.31	-21.3000
1.1441	11.7422	-172.29	-21.3950
1.1472	11.8667	-172.27	-21.4866
1.1503	11.9881	-172.26	-21.5750
1.1535	12.1064	-172.24	-21.6603
1.1566	12.2218	-172.22	-21.7427

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 1.00

B	N	PHASE	-1/N(DB)
1.0038	4.2589	17.97	-12.5860
1.0076	2.8742	21.23	-9.1704
1.0114	1.8339	26.98	-5.2673
1.0152	1.0064	40.75	-0.0557
1.0191	0.5042	89.68	5.9484
1.0229	0.7690	151.47	2.2811
1.0267	1.3142	169.36	-2.3733
1.0305	1.8618	176.06	-5.3987
1.0343	2.3817	179.48	-7.5376
1.0381	2.8715	-178.44	-9.1622
1.0419	3.3333	-177.05	-10.4575
1.0457	3.7696	-176.05	-11.5259
1.0496	4.1828	-175.29	-12.4294
1.0534	4.5752	-174.70	-13.2082
1.0572	4.9485	-174.22	-13.8895
1.0610	5.3045	-173.83	-14.4928
1.0648	5.6445	-173.50	-15.0324
1.0686	5.9697	-173.21	-15.5190
1.0724	6.2813	-172.97	-15.9610
1.0762	6.5802	-172.76	-16.3647
1.0800	6.8673	-172.57	-16.7357
1.0839	7.1432	-172.40	-17.0779
1.0877	7.4088	-172.25	-17.3950
1.0915	7.6646	-172.12	-17.6898
1.0953	7.9112	-172.00	-17.9649
1.0991	8.1491	-171.89	-18.2222
1.1029	8.3787	-171.78	-18.4636
1.1067	8.6005	-171.69	-18.6905
1.1105	8.8149	-171.60	-18.9044
1.1144	9.0222	-171.52	-19.1063
1.1182	9.2228	-171.45	-19.2972
1.1220	9.4169	-171.38	-19.4781
1.1258	9.6048	-171.31	-19.6498
1.1296	9.7869	-171.25	-19.8129
1.1334	9.9634	-171.20	-19.9681
1.1372	10.1344	-171.14	-20.1160
1.1410	10.3003	-171.09	-20.2570
1.1448	10.4612	-171.04	-20.3916
1.1487	10.6173	-171.00	-20.5203
1.1525	10.7688	-170.95	-20.6434
1.1563	10.9159	-170.91	-20.7612
1.1601	11.0587	-170.87	-20.8741
1.1639	11.1975	-170.84	-20.9824
1.1677	11.3322	-170.80	-21.0863
1.1715	11.4631	-170.77	-21.1860
1.1753	11.5903	-170.73	-21.2819
1.1792	11.7140	-170.70	-21.3741
1.1830	11.8342	-170.67	-21.4627
1.1868	11.9510	-170.64	-21.5481
1.1906	12.0646	-170.62	-21.6303

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 1.00

B	N	PHASE	-1/N(DB)
1.0047	5.3888	21.09	-14.6298
1.0094	3.8668	24.11	-11.7470
1.0141	2.7222	28.63	-8.6984
1.0188	1.7955	36.74	-5.0839
1.0235	1.0663	54.93	-0.5576
1.0281	0.7038	100.15	3.0512
1.0328	0.9520	146.23	0.4276
1.0375	1.4531	164.89	-3.2457
1.0422	1.9825	173.06	-5.9444
1.0469	2.4962	177.49	-7.9456
1.0516	2.9856	-179.76	-9.5006
1.0563	3.4498	-177.88	-10.7558
1.0610	3.8899	-176.52	-11.7989
1.0657	4.3077	-175.49	-12.6850
1.0704	4.7048	-174.68	-13.4509
1.0751	5.0828	-174.02	-14.1220
1.0797	5.4431	-173.48	-14.7168
1.0844	5.7870	-173.02	-15.2490
1.0891	6.1157	-172.63	-15.7289
1.0938	6.4302	-172.30	-16.1644
1.0985	6.7314	-172.00	-16.5621
1.1032	7.0202	-171.74	-16.9270
1.1079	7.2974	-171.51	-17.2634
1.1126	7.5636	-171.31	-17.5746
1.1173	7.8195	-171.12	-17.8635
1.1220	8.0656	-170.95	-18.1327
1.1267	8.3024	-170.80	-18.3841
1.1314	8.5305	-170.66	-18.6195
1.1360	8.7502	-170.53	-18.8404
1.1407	8.9621	-170.41	-19.0482
1.1454	9.1664	-170.30	-19.2439
1.1501	9.3635	-170.19	-19.4287
1.1548	9.5537	-170.10	-19.6035
1.1595	9.7375	-170.01	-19.7689
1.1642	9.9149	-169.93	-19.9258
1.1689	10.0863	-169.85	-20.0747
1.1736	10.2520	-169.77	-20.2162
1.1783	10.4122	-169.70	-20.3508
1.1830	10.5671	-169.64	-20.4791
1.1876	10.7169	-169.57	-20.6014
1.1923	10.8619	-169.51	-20.7181
1.1970	11.0021	-169.46	-20.8295
1.2017	11.1378	-169.40	-20.9360
1.2064	11.2692	-169.35	-21.0378
1.2111	11.3963	-169.30	-21.1353
1.2158	11.5195	-169.26	-21.2286
1.2205	11.6387	-169.21	-21.3181
1.2252	11.7541	-169.17	-21.4038
1.2299	11.8660	-169.13	-21.4860
1.2346	11.9743	-169.09	-21.5650

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2530	0.9012	12.06	0.9039
1.2561	0.1010	99.69	19.9113
1.2591	0.7017	177.39	3.0774
1.2622	1.2726	-178.89	-2.0940
1.2652	1.7728	-177.60	-4.9734
1.2682	2.2211	-176.94	-6.9313
1.2713	2.6294	-176.54	-8.3973
1.2743	3.0058	-176.26	-9.5592
1.2773	3.3557	-176.06	-10.5157
1.2804	3.6833	-175.90	-11.3248
1.2834	3.9916	-175.78	-12.0230
1.2865	4.2831	-175.68	-12.6352
1.2895	4.5597	-175.59	-13.1788
1.2925	4.8231	-175.52	-13.6665
1.2956	5.0745	-175.46	-14.1078
1.2986	5.3149	-175.41	-14.5100
1.3017	5.5454	-175.36	-14.8787
1.3047	5.7668	-175.32	-15.2187
1.3077	5.9798	-175.28	-15.5337
1.3108	6.1849	-175.25	-15.8266
1.3138	6.3827	-175.22	-16.1001
1.3168	6.5737	-175.19	-16.3562
1.3199	6.7583	-175.17	-16.5968
1.3229	6.9369	-175.14	-16.8233
1.3260	7.1099	-175.12	-17.0373
1.3290	7.2775	-175.10	-17.2396
1.3320	7.4400	-175.08	-17.4315
1.3351	7.5978	-175.07	-17.6137
1.3381	7.7509	-175.05	-17.7871
1.3412	7.8998	-175.03	-17.9523
1.3442	8.0444	-175.02	-18.1099
1.3472	8.1852	-175.01	-18.2605
1.3503	8.3221	-174.99	-18.4046
1.3533	8.4554	-174.98	-18.5427
1.3563	8.5852	-174.97	-18.6750
1.3594	8.7117	-174.96	-18.8020
1.3624	8.8350	-174.95	-18.9241
1.3655	8.9552	-174.94	-19.0415
1.3685	9.0724	-174.93	-19.1544
1.3715	9.1867	-174.92	-19.2632
1.3746	9.2983	-174.91	-19.3681
1.3776	9.4073	-174.90	-19.4693
1.3807	9.5136	-174.90	-19.5669
1.3837	9.6175	-174.89	-19.6612
1.3867	9.7190	-174.88	-19.7524
1.3898	9.8181	-174.87	-19.8405
1.3928	9.9150	-174.87	-19.9258
1.3958	10.0097	-174.86	-20.0084
1.3989	10.1022	-174.85	-20.0883
1.4019	10.1927	-174.85	-20.1658

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2533	1.4314	12.57	-3.1149
1.2566	0.5080	23.32	5.8825
1.2598	0.2688	154.22	11.4118
1.2631	0.8354	176.82	1.5617
1.2664	1.3510	-179.35	-2.6133
1.2697	1.8149	-177.78	-5.1771
1.2730	2.2379	-176.91	-6.9967
1.2762	2.6278	-176.35	-8.3919
1.2795	2.9904	-175.97	-9.5145
1.2828	3.3296	-175.68	-10.4479
1.2861	3.6489	-175.46	-11.2432
1.2894	3.9507	-175.28	-11.9334
1.2926	4.2369	-175.14	-12.5409
1.2959	4.5092	-175.02	-13.0820
1.2992	4.7690	-174.91	-13.5686
1.3025	5.0175	-174.82	-14.0097
1.3058	5.2555	-174.75	-14.4123
1.3091	5.4840	-174.68	-14.7820
1.3123	5.7037	-174.62	-15.1231
1.3156	5.9152	-174.56	-15.4394
1.3189	6.1190	-174.52	-15.7336
1.3222	6.3157	-174.47	-16.0085
1.3255	6.5057	-174.43	-16.2659
1.3287	6.6895	-174.39	-16.5078
1.3320	6.8673	-174.36	-16.7357
1.3353	7.0395	-174.33	-16.9508
1.3386	7.2064	-174.30	-17.1543
1.3419	7.3682	-174.27	-17.3473
1.3451	7.5253	-174.25	-17.5305
1.3484	7.6778	-174.22	-17.7048
1.3517	7.8260	-174.20	-17.8708
1.3550	7.9701	-174.18	-18.0293
1.3583	8.1101	-174.16	-18.1806
1.3615	8.2464	-174.14	-18.3253
1.3648	8.3790	-174.12	-18.4639
1.3681	8.5082	-174.11	-18.5967
1.3714	8.6339	-174.09	-18.7242
1.3747	8.7565	-174.08	-18.8466
1.3779	8.8759	-174.06	-18.9643
1.3812	8.9924	-174.05	-19.0775
1.3845	9.1059	-174.03	-19.1864
1.3878	9.2167	-174.02	-19.2915
1.3911	9.3247	-174.01	-19.3927
1.3943	9.4302	-174.00	-19.4904
1.3976	9.5331	-173.99	-19.5847
1.4009	9.6337	-173.98	-19.6758
1.4042	9.7318	-173.97	-19.7639
1.4075	9.8277	-173.96	-19.8490
1.4108	9.9214	-173.95	-19.9314
1.4140	10.0129	-173.94	-20.0112

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2535	1.7765	13.28	-4.9915
1.2569	0.8243	20.02	1.6779
1.2604	0.1921	75.63	14.3301
1.2639	0.5695	169.32	4.8896
1.2673	1.0902	178.15	-0.7503
1.2708	1.5642	-178.98	-3.8860
1.2743	1.9974	-177.55	-6.0094
1.2778	2.3970	-176.69	-7.5935
1.2812	2.7686	-176.12	-8.8453
1.2847	3.1164	-175.70	-9.8730
1.2882	3.4435	-175.38	-10.7401
1.2916	3.7526	-175.14	-11.4867
1.2951	4.0458	-174.94	-12.1400
1.2986	4.3246	-174.77	-12.7188
1.3020	4.5905	-174.63	-13.2371
1.3055	4.8446	-174.51	-13.7052
1.3090	5.0880	-174.41	-14.1310
1.3125	5.3216	-174.31	-14.5208
1.3159	5.5460	-174.23	-14.8796
1.3194	5.7620	-174.16	-15.2114
1.3229	5.9701	-174.10	-15.5196
1.3263	6.1707	-174.04	-15.8068
1.3298	6.3645	-173.99	-16.0753
1.3333	6.5518	-173.94	-16.3272
1.3367	6.7329	-173.89	-16.5641
1.3402	6.9083	-173.85	-16.7874
1.3437	7.0782	-173.81	-16.9984
1.3471	7.2428	-173.78	-17.1982
1.3506	7.4026	-173.75	-17.3876
1.3541	7.5576	-173.71	-17.5676
1.3576	7.7081	-173.69	-17.7389
1.3610	7.8543	-173.66	-17.9021
1.3645	7.9964	-173.63	-18.0579
1.3680	8.1346	-173.61	-18.2067
1.3714	8.2691	-173.59	-18.3491
1.3749	8.3999	-173.57	-18.4855
1.3784	8.5272	-173.55	-18.6161
1.3818	8.6512	-173.53	-18.7416
1.3853	8.7720	-173.51	-18.8620
1.3888	8.8897	-173.49	-18.9778
1.3922	9.0044	-173.47	-19.0891
1.3957	9.1163	-173.46	-19.1964
1.3992	9.2253	-173.44	-19.2996
1.4027	9.3317	-173.43	-19.3992
1.4061	9.4355	-173.41	-19.4953
1.4096	9.5368	-173.40	-19.5880
1.4131	9.6356	-173.39	-19.6776
1.4165	9.7321	-173.37	-19.7641
1.4200	9.8263	-173.36	-19.8478
1.4235	9.9182	-173.35	-19.9287

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2539	2.4475	15.02	-7.7744
1.2578	1.4370	19.28	-3.1491
1.2617	0.6865	30.89	3.2671
1.2657	0.2555	101.69	11.8517
1.2696	0.6316	165.24	3.9917
1.2735	1.1136	175.84	-0.9344
1.2774	1.5653	179.71	-3.8918
1.2813	1.9844	-178.28	-5.9527
1.2852	2.3749	-177.06	-7.5130
1.2891	2.7405	-176.23	-8.7566
1.2931	3.0844	-175.62	-9.7834
1.2970	3.4092	-175.16	-10.6530
1.3009	3.7170	-174.80	-11.4038
1.3048	4.0095	-174.51	-12.0617
1.3087	4.2882	-174.27	-12.6455
1.3126	4.5544	-174.06	-13.1686
1.3166	4.8091	-173.89	-13.6412
1.3205	5.0532	-173.73	-14.0713
1.3244	5.2875	-173.60	-14.4650
1.3283	5.5128	-173.48	-14.8274
1.3322	5.7295	-173.38	-15.1624
1.3361	5.9384	-173.28	-15.4734
1.3400	6.1398	-173.20	-15.7631
1.3440	6.3343	-173.12	-16.0339
1.3479	6.5221	-173.05	-16.2878
1.3518	6.7038	-172.99	-16.5264
1.3557	6.8795	-172.93	-16.7512
1.3596	7.0497	-172.87	-16.9634
1.3635	7.2145	-172.82	-17.1642
1.3674	7.3743	-172.77	-17.3544
1.3714	7.5293	-172.73	-17.5351
1.3753	7.6797	-172.69	-17.7068
1.3792	7.8256	-172.65	-17.8704
1.3831	7.9674	-172.61	-18.0263
1.3870	8.1051	-172.58	-18.1751
1.3909	8.2389	-172.54	-18.3174
1.3948	8.3690	-172.51	-18.4535
1.3988	8.4955	-172.48	-18.5838
1.4027	8.6186	-172.46	-18.7088
1.4066	8.7384	-172.43	-18.8286
1.4105	8.8550	-172.40	-18.9437
1.4144	8.9685	-172.38	-19.0544
1.4183	9.0790	-172.36	-19.1608
1.4223	9.1867	-172.34	-19.2632
1.4262	9.2916	-172.31	-19.3618
1.4301	9.3938	-172.29	-19.4568
1.4340	9.4934	-172.27	-19.5484
1.4379	9.5905	-172.26	-19.6368
1.4418	9.6851	-172.24	-19.7221
1.4457	9.7774	-172.22	-19.8045

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2548	3.4069	17.97	-10.6473
1.2595	2.2990	21.23	-7.2308
1.2643	1.4668	26.98	-3.3274
1.2691	0.8047	40.77	1.8868
1.2738	0.4033	89.75	7.8884
1.2786	0.6156	151.50	4.2139
1.2834	1.0519	169.37	-0.4391
1.2881	1.4900	176.06	-3.4635
1.2929	1.9059	179.49	-5.6019
1.2977	2.2978	-178.44	-7.2262
1.3024	2.6672	-177.05	-8.5212
1.3072	3.0163	-176.05	-9.5895
1.3120	3.3469	-175.29	-10.4929
1.3167	3.6608	-174.70	-11.2715
1.3215	3.9595	-174.22	-11.9528
1.3262	4.2443	-173.83	-12.5560
1.3310	4.5162	-173.50	-13.0955
1.3358	4.7764	-173.21	-13.5821
1.3405	5.0257	-172.97	-14.0240
1.3453	5.2649	-172.76	-14.4277
1.3501	5.4945	-172.57	-14.7986
1.3548	5.7153	-172.40	-15.1408
1.3596	5.9278	-172.25	-15.4578
1.3644	6.1324	-172.12	-15.7527
1.3691	6.3297	-172.00	-16.0277
1.3739	6.5200	-171.89	-16.2850
1.3787	6.7037	-171.78	-16.5263
1.3834	6.8812	-171.69	-16.7533
1.3882	7.0527	-171.60	-16.9671
1.3930	7.2185	-171.52	-17.1689
1.3977	7.3790	-171.45	-17.3599
1.4025	7.5342	-171.38	-17.5408
1.4073	7.6846	-171.31	-17.7124
1.4120	7.8303	-171.25	-17.8755
1.4168	7.9714	-171.19	-18.0307
1.4216	8.1083	-171.14	-18.1785
1.4263	8.2410	-171.09	-18.3195
1.4311	8.3697	-171.04	-18.4542
1.4359	8.4946	-171.00	-18.5828
1.4406	8.6158	-170.95	-18.7059
1.4454	8.7334	-170.91	-18.8237
1.4502	8.8477	-170.87	-18.9366
1.4549	8.9587	-170.84	-19.0449
1.4597	9.0665	-170.80	-19.1487
1.4644	9.1712	-170.77	-19.2485
1.4692	9.2729	-170.73	-19.3443
1.4740	9.3719	-170.70	-19.4365
1.4787	9.4680	-170.67	-19.5252
1.4835	9.5615	-170.64	-19.6105
1.4883	9.6524	-170.62	-19.6927

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 1.25

B	N	PHASE	-1/N(DB)
1.2559	4.3112	21.09	-12.6920
1.2617	3.0937	24.11	-9.8095
1.2676	2.1780	28.63	-6.7613
1.2735	1.4368	36.73	-3.1478
1.2793	0.8533	54.92	1.3778
1.2852	0.5631	100.11	4.9887
1.2910	0.7613	146.20	2.3689
1.2969	1.1621	164.88	-1.3047
1.3028	1.5856	173.06	-4.0036
1.3086	1.9965	177.48	-6.0053
1.3145	2.3880	-179.76	-7.5605
1.3204	2.7593	-177.89	-8.8160
1.3262	3.1114	-176.53	-9.8592
1.3321	3.4456	-175.49	-10.7454
1.3379	3.7633	-174.68	-11.5114
1.3438	4.0657	-174.02	-12.1826
1.3497	4.3539	-173.48	-12.7775
1.3555	4.6290	-173.02	-13.3097
1.3614	4.8919	-172.63	-13.7896
1.3673	5.1435	-172.30	-14.2252
1.3731	5.3845	-172.00	-14.6229
1.3790	5.6156	-171.75	-14.9879
1.3849	5.8373	-171.51	-15.3242
1.3907	6.0503	-171.31	-15.6355
1.3966	6.2550	-171.12	-15.9245
1.4024	6.4518	-170.95	-16.1936
1.4083	6.6413	-170.80	-16.4451
1.4142	6.8238	-170.66	-16.6805
1.4200	6.9996	-170.53	-16.9014
1.4259	7.1690	-170.41	-17.1092
1.4318	7.3325	-170.30	-17.3050
1.4376	7.4902	-170.20	-17.4899
1.4435	7.6424	-170.10	-17.6646
1.4493	7.7894	-170.01	-17.8300
1.4552	7.9313	-169.93	-17.9869
1.4611	8.0685	-169.85	-18.1358
1.4669	8.2010	-169.77	-18.2774
1.4728	8.3292	-169.70	-18.4120
1.4787	8.4531	-169.64	-18.5403
1.4845	8.5730	-169.57	-18.6626
1.4904	8.6889	-169.51	-18.7793
1.4963	8.8011	-169.46	-18.8907
1.5021	8.9097	-169.40	-18.9972
1.5080	9.0148	-169.35	-19.0991
1.5138	9.1165	-169.30	-19.1966
1.5197	9.2150	-169.26	-19.2899
1.5256	9.3104	-169.21	-19.3794
1.5314	9.4028	-169.17	-19.4651
1.5373	9.4922	-169.13	-19.5474
1.5432	9.5789	-169.09	-19.6263

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5036	0.7510	12.06	2.4870
1.5073	0.0842	99.66	21.4954
1.5109	0.5846	177.39	4.6624
1.5146	1.0605	-178.89	-0.5100
1.5182	1.4772	-177.61	-3.3890
1.5219	1.8508	-176.94	-5.3471
1.5255	2.1911	-176.54	-6.8131
1.5292	2.5047	-176.26	-7.9752
1.5328	2.7963	-176.06	-8.9316
1.5365	3.0693	-175.90	-9.7407
1.5401	3.3262	-175.78	-10.4390
1.5438	3.5691	-175.68	-11.0513
1.5474	3.7997	-175.59	-11.5949
1.5510	4.0191	-175.52	-12.0826
1.5547	4.2286	-175.46	-12.5238
1.5583	4.4289	-175.41	-12.9260
1.5620	4.6210	-175.36	-13.2948
1.5656	4.8055	-175.32	-13.6348
1.5693	4.9830	-175.28	-13.9498
1.5729	5.1539	-175.25	-14.2427
1.5766	5.3187	-175.22	-14.5162
1.5802	5.4779	-175.19	-14.7723
1.5839	5.6318	-175.17	-15.0129
1.5875	5.7806	-175.14	-15.2394
1.5911	5.9247	-175.12	-15.4534
1.5948	6.0644	-175.10	-15.6557
1.5984	6.1998	-175.08	-15.8476
1.6021	6.3313	-175.07	-16.0298
1.6057	6.4589	-175.05	-16.2032
1.6094	6.5830	-175.03	-16.3684
1.6130	6.7035	-175.02	-16.5260
1.6167	6.8208	-175.01	-16.6767
1.6203	6.9349	-174.99	-16.8208
1.6240	7.0460	-174.98	-16.9588
1.6276	7.1542	-174.97	-17.0912
1.6313	7.2595	-174.96	-17.2182
1.6349	7.3623	-174.95	-17.3402
1.6385	7.4624	-174.94	-17.4576
1.6422	7.5601	-174.93	-17.5706
1.6458	7.6554	-174.92	-17.6794
1.6495	7.7484	-174.91	-17.7843
1.6531	7.8392	-174.90	-17.8854
1.6568	7.9278	-174.90	-17.9831
1.6604	8.0144	-174.89	-18.0774
1.6641	8.0989	-174.88	-18.1685
1.6677	8.1816	-174.87	-18.2567
1.6714	8.2623	-174.87	-18.3420
1.6750	8.3412	-174.86	-18.4245
1.6786	8.4183	-174.85	-18.5045
1.6823	8.4938	-174.85	-18.5820

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5039	1.1928	12.57	-1.5312
1.5079	0.4233	23.32	7.4663
1.5118	0.2240	154.22	12.9946
1.5157	0.6962	176.82	3.1449
1.5197	1.1259	-179.35	-1.0297
1.5236	1.5124	-177.77	-3.5935
1.5276	1.8649	-176.91	-5.4132
1.5315	2.1899	-176.35	-6.8083
1.5354	2.4920	-175.97	-7.9308
1.5394	2.7747	-175.68	-8.8644
1.5433	3.0408	-175.46	-9.6596
1.5472	3.2922	-175.28	-10.3498
1.5512	3.5307	-175.14	-10.9573
1.5551	3.7577	-175.02	-11.4984
1.5591	3.9742	-174.91	-11.9850
1.5630	4.1812	-174.82	-12.4261
1.5669	4.3796	-174.75	-12.8287
1.5709	4.5700	-174.68	-13.1984
1.5748	4.7531	-174.62	-13.5395
1.5787	4.9293	-174.56	-13.8557
1.5827	5.0992	-174.52	-14.1500
1.5866	5.2631	-174.47	-14.4248
1.5905	5.4214	-174.43	-14.6823
1.5945	5.5746	-174.39	-14.9242
1.5984	5.7227	-174.36	-15.1521
1.6024	5.8662	-174.33	-15.3672
1.6063	6.0053	-174.30	-15.5707
1.6102	6.1402	-174.27	-15.7637
1.6142	6.2711	-174.25	-15.9469
1.6181	6.3982	-174.22	-16.1212
1.6220	6.5217	-174.20	-16.2872
1.6260	6.6417	-174.18	-16.4456
1.6299	6.7585	-174.16	-16.5969
1.6339	6.8720	-174.14	-16.7417
1.6378	6.9825	-174.12	-16.8802
1.6417	7.0901	-174.11	-17.0131
1.6457	7.1950	-174.09	-17.1405
1.6496	7.2971	-174.08	-17.2630
1.6535	7.3966	-174.06	-17.3806
1.6575	7.4936	-174.05	-17.4938
1.6614	7.5883	-174.03	-17.6028
1.6653	7.6806	-174.02	-17.7078
1.6693	7.7706	-174.01	-17.8091
1.6732	7.8585	-174.00	-17.9068
1.6772	7.9443	-173.99	-18.0011
1.6811	8.0281	-173.98	-18.0922
1.6850	8.1099	-173.97	-18.1803
1.6890	8.1898	-173.96	-18.2654
1.6929	8.2678	-173.95	-18.3478
1.6968	8.3441	-173.94	-18.4276

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5042	1.4803	13.28	-3.4070
1.5083	0.6868	20.02	3.2631
1.5125	0.1600	75.68	15.9169
1.5167	0.4748	169.32	6.4699
1.5208	0.9087	178.15	0.8314
1.5250	1.3037	-178.98	-2.3037
1.5291	1.6647	-177.55	-4.4269
1.5333	1.9978	-176.69	-6.0109
1.5375	2.3074	-176.12	-7.2626
1.5416	2.5972	-175.70	-8.2902
1.5458	2.8699	-175.38	-9.1573
1.5500	3.1275	-175.14	-9.9039
1.5541	3.3718	-174.94	-10.5571
1.5583	3.6041	-174.77	-11.1360
1.5625	3.8257	-174.63	-11.6542
1.5666	4.0375	-174.51	-12.1222
1.5708	4.2404	-174.41	-12.5480
1.5749	4.4350	-174.31	-12.9378
1.5791	4.6220	-174.23	-13.2966
1.5833	4.8020	-174.16	-13.6284
1.5874	4.9754	-174.10	-13.9365
1.5916	5.1426	-174.04	-14.2237
1.5958	5.3041	-173.99	-14.4922
1.5999	5.4602	-173.94	-14.7441
1.6041	5.6111	-173.89	-14.9810
1.6083	5.7573	-173.85	-15.2043
1.6124	5.8988	-173.81	-15.4153
1.6166	6.0360	-173.78	-15.6150
1.6207	6.1691	-173.75	-15.8045
1.6249	6.2983	-173.71	-15.9845
1.6291	6.4237	-173.69	-16.1557
1.6332	6.5456	-173.66	-16.3190
1.6374	6.6640	-173.63	-16.4747
1.6416	6.7792	-173.61	-16.6236
1.6457	6.8912	-173.59	-16.7659
1.6499	7.0002	-173.57	-16.9023
1.6541	7.1064	-173.54	-17.0329
1.6582	7.2097	-173.53	-17.1584
1.6624	7.3104	-173.51	-17.2788
1.6665	7.4085	-173.49	-17.3945
1.6707	7.5041	-173.47	-17.5059
1.6749	7.5973	-173.46	-17.6131
1.6790	7.6881	-173.44	-17.7164
1.6832	7.7768	-173.43	-17.8160
1.6874	7.8633	-173.41	-17.9120
1.6915	7.9476	-173.40	-18.0048
1.6957	8.0300	-173.39	-18.0943
1.6999	8.1104	-173.37	-18.1808
1.7040	8.1889	-173.36	-18.2645
1.7082	8.2656	-173.35	-18.3454

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5047	2.0395	15.02	-6.1906
1.5094	1.1975	19.28	-1.5655
1.5141	0.5721	30.89	4.8507
1.5188	0.2129	101.69	13.4351
1.5235	0.5263	165.24	5.5754
1.5282	0.9280	175.84	0.6490
1.5329	1.3044	179.71	-2.3082
1.5376	1.6537	-178.28	-4.3692
1.5423	1.9791	-177.06	-5.9293
1.5470	2.2838	-176.22	-7.1730
1.5517	2.5703	-175.62	-8.1998
1.5564	2.8410	-175.16	-9.0694
1.5611	3.0975	-174.80	-9.8201
1.5658	3.3412	-174.51	-10.4781
1.5705	3.5735	-174.27	-11.0619
1.5752	3.7953	-174.06	-11.5850
1.5799	4.0076	-173.89	-12.0576
1.5846	4.2110	-173.73	-12.4877
1.5893	4.4063	-173.60	-12.8814
1.5940	4.5940	-173.48	-13.2438
1.5987	4.7746	-173.38	-13.5788
1.6034	4.9487	-173.29	-13.8898
1.6080	5.1165	-173.20	-14.1795
1.6127	5.2786	-173.12	-14.4503
1.6174	5.4351	-173.05	-14.7042
1.6221	5.5865	-172.99	-14.9428
1.6268	5.7330	-172.93	-15.1676
1.6315	5.8748	-172.87	-15.3798
1.6362	6.0121	-172.82	-15.5806
1.6409	6.1453	-172.77	-15.7708
1.6456	6.2744	-172.73	-15.9515
1.6503	6.3997	-172.69	-16.1232
1.6550	6.5213	-172.65	-16.2867
1.6597	6.6395	-172.61	-16.4427
1.6644	6.7542	-172.58	-16.5915
1.6691	6.8658	-172.54	-16.7337
1.6738	6.9742	-172.51	-16.8698
1.6785	7.0796	-172.48	-17.0002
1.6832	7.1822	-172.46	-17.1251
1.6879	7.2820	-172.43	-17.2450
1.6926	7.3791	-172.40	-17.3601
1.6973	7.4737	-172.38	-17.4707
1.7020	7.5658	-172.36	-17.5771
1.7067	7.6556	-172.34	-17.6795
1.7114	7.7430	-172.31	-17.7781
1.7161	7.8281	-172.29	-17.8732
1.7208	7.9111	-172.27	-17.9648
1.7255	7.9921	-172.26	-18.0532
1.7302	8.0709	-172.24	-18.1385
1.7349	8.1479	-172.22	-18.2209

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5057	2.8392	17.97	-9.0639
1.5114	1.9159	21.23	-5.6477
1.5172	1.2224	26.98	-1.7445
1.5229	0.6708	40.76	3.4685
1.5286	0.3361	89.72	9.4712
1.5343	0.5129	151.49	5.7997
1.5400	0.8764	169.36	1.1461
1.5457	1.2414	176.06	-1.8785
1.5515	1.5880	179.48	-4.0172
1.5572	1.9146	-178.44	-5.6416
1.5629	2.2225	-177.05	-6.9368
1.5686	2.5134	-176.05	-8.0051
1.5743	2.7889	-175.29	-8.9086
1.5801	3.0504	-174.70	-9.6872
1.5858	3.2993	-174.22	-10.3685
1.5915	3.5366	-173.83	-10.9718
1.5972	3.7633	-173.50	-11.5113
1.6029	3.9801	-173.21	-11.9979
1.6086	4.1878	-172.97	-12.4398
1.6144	4.3871	-172.76	-12.8436
1.6201	4.5785	-172.57	-13.2145
1.6258	4.7625	-172.40	-13.5567
1.6315	4.9396	-172.25	-13.8738
1.6372	5.1101	-172.12	-14.1686
1.6430	5.2745	-172.00	-14.4436
1.6487	5.4331	-171.89	-14.7009
1.6544	5.5862	-171.78	-14.9423
1.6601	5.7340	-171.69	-15.1692
1.6658	5.8770	-171.60	-15.3830
1.6715	6.0151	-171.52	-15.5849
1.6773	6.1489	-171.45	-15.7759
1.6830	6.2783	-171.38	-15.9568
1.6887	6.4036	-171.31	-16.1284
1.6944	6.5250	-171.25	-16.2915
1.7001	6.6426	-171.20	-16.4467
1.7059	6.7566	-171.14	-16.5946
1.7116	6.8672	-171.09	-16.7356
1.7173	6.9745	-171.04	-16.8702
1.7230	7.0785	-171.00	-16.9989
1.7287	7.1796	-170.95	-17.1219
1.7344	7.2776	-170.91	-17.2398
1.7402	7.3728	-170.87	-17.3527
1.7459	7.4653	-170.84	-17.4609
1.7516	7.5551	-170.80	-17.5648
1.7573	7.6424	-170.77	-17.6646
1.7630	7.7272	-170.73	-17.7605
1.7688	7.8096	-170.70	-17.8526
1.7745	7.8898	-170.67	-17.9413
1.7802	7.9677	-170.64	-18.0266
1.7859	8.0434	-170.62	-18.1088

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5070	3.5927	21.09	-11.1083
1.5141	2.5780	24.11	-8.2256
1.5211	1.8149	28.63	-5.1770
1.5281	1.1972	36.73	-1.5632
1.5352	0.7110	54.93	2.9627
1.5422	0.4692	100.13	6.5726
1.5493	0.6345	146.21	3.9511
1.5563	0.9685	164.88	0.2776
1.5633	1.3215	173.06	-2.4211
1.5704	1.6639	177.49	-4.4227
1.5774	1.9902	-179.76	-5.9778
1.5844	2.2996	-177.89	-7.2331
1.5915	2.5931	-176.53	-8.2763
1.5985	2.8716	-175.49	-9.1624
1.6055	3.1363	-174.68	-9.9283
1.6126	3.3883	-174.02	-10.5995
1.6196	3.6284	-173.48	-11.1944
1.6267	3.8577	-173.02	-11.7266
1.6337	4.0768	-172.63	-12.2064
1.6407	4.2865	-172.30	-12.6420
1.6478	4.4873	-172.00	-13.0397
1.6548	4.6799	-171.74	-13.4047
1.6618	4.8647	-171.51	-13.7410
1.6689	5.0421	-171.31	-14.0523
1.6759	5.2127	-171.12	-14.3412
1.6829	5.3768	-170.95	-14.6104
1.6900	5.5347	-170.80	-14.8618
1.6970	5.6867	-170.66	-15.0972
1.7041	5.8332	-170.53	-15.3181
1.7111	5.9744	-170.41	-15.5259
1.7181	6.1106	-170.30	-15.7217
1.7252	6.2420	-170.20	-15.9065
1.7322	6.3689	-170.10	-16.0813
1.7392	6.4914	-170.01	-16.2467
1.7463	6.6097	-169.93	-16.4036
1.7533	6.7240	-169.85	-16.5525
1.7603	6.8344	-169.77	-16.6940
1.7674	6.9412	-169.70	-16.8287
1.7744	7.0445	-169.64	-16.9570
1.7814	7.1444	-169.57	-17.0793
1.7885	7.2410	-169.51	-17.1960
1.7955	7.3345	-169.46	-17.3074
1.8026	7.4249	-169.40	-17.4138
1.8096	7.5125	-169.35	-17.5157
1.8166	7.5973	-169.30	-17.6132
1.8237	7.6794	-169.26	-17.7065
1.8307	7.7589	-169.21	-17.7960
1.8377	7.8358	-169.17	-17.8817
1.8448	7.9104	-169.13	-17.9639
1.8518	7.9826	-169.09	-18.0429

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7543	0.6437	12.06	3.8257
1.7585	0.0722	99.63	22.8349
1.7628	0.5011	177.39	6.0023
1.7670	0.9089	-178.89	0.8296
1.7713	1.2662	-177.61	-2.0497
1.7755	1.5863	-176.94	-4.0078
1.7798	1.8780	-176.54	-5.4739
1.7840	2.1468	-176.26	-6.6359
1.7883	2.3967	-176.06	-7.5924
1.7925	2.6307	-175.90	-8.4015
1.7968	2.8510	-175.78	-9.0998
1.8010	3.0592	-175.68	-9.7121
1.8053	3.2567	-175.59	-10.2557
1.8095	3.4448	-175.52	-10.7434
1.8138	3.6244	-175.46	-11.1847
1.8181	3.7961	-175.41	-11.5868
1.8223	3.9608	-175.36	-11.9556
1.8266	4.1189	-175.32	-12.2957
1.8308	4.2710	-175.28	-12.6106
1.8351	4.4175	-175.25	-12.9036
1.8393	4.5588	-175.22	-13.1770
1.8436	4.6952	-175.19	-13.4332
1.8478	4.8271	-175.17	-13.6737
1.8521	4.9547	-175.14	-13.9003
1.8563	5.0782	-175.12	-14.1142
1.8606	5.1979	-175.10	-14.3166
1.8648	5.3140	-175.08	-14.5085
1.8691	5.4267	-175.07	-14.6907
1.8733	5.5361	-175.05	-14.8641
1.8776	5.6424	-175.03	-15.0293
1.8819	5.7458	-175.02	-15.1869
1.8861	5.8463	-175.01	-15.3376
1.8904	5.9441	-174.99	-15.4817
1.8946	6.0393	-174.98	-15.6197
1.8989	6.1320	-174.97	-15.7521
1.9031	6.2224	-174.96	-15.8791
1.9074	6.3104	-174.95	-16.0011
1.9116	6.3963	-174.94	-16.1185
1.9159	6.4800	-174.93	-16.2315
1.9201	6.5617	-174.92	-16.3403
1.9244	6.6414	-174.91	-16.4452
1.9286	6.7192	-174.90	-16.5463
1.9329	6.7952	-174.90	-16.6440
1.9371	6.8694	-174.89	-16.7383
1.9414	6.9418	-174.88	-16.8295
1.9457	7.0126	-174.87	-16.9176
1.9499	7.0818	-174.87	-17.0029
1.9542	7.1495	-174.86	-17.0855
1.9584	7.2156	-174.85	-17.1654
1.9627	7.2803	-174.85	-17.2429

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7546	1.0222	12.57	-0.1910
1.7592	0.3626	23.33	8.8103
1.7638	0.1922	154.27	14.3230
1.7684	0.5971	176.82	4.4792
1.7730	0.9654	-179.35	0.3061
1.7776	1.2968	-177.77	-2.2571
1.7822	1.5989	-176.90	-4.0765
1.7868	1.8775	-176.35	-5.4715
1.7913	2.1364	-175.96	-6.5938
1.7959	2.3788	-175.68	-7.5272
1.8005	2.6069	-175.46	-8.3224
1.8051	2.8224	-175.28	-9.0124
1.8097	3.0269	-175.14	-9.6199
1.8143	3.2214	-175.02	-10.1609
1.8189	3.4070	-174.91	-10.6475
1.8235	3.5845	-174.82	-11.0885
1.8281	3.7545	-174.75	-11.4911
1.8327	3.9178	-174.68	-11.8608
1.8373	4.0747	-174.62	-12.2019
1.8419	4.2257	-174.56	-12.5181
1.8465	4.3714	-174.52	-12.8123
1.8511	4.5119	-174.47	-13.0871
1.8557	4.6476	-174.43	-13.3446
1.8603	4.7788	-174.39	-13.5865
1.8648	4.9058	-174.36	-13.8143
1.8694	5.0289	-174.33	-14.0294
1.8740	5.1481	-174.30	-14.2329
1.8786	5.2637	-174.27	-14.4258
1.8832	5.3759	-174.25	-14.6090
1.8878	5.4849	-174.22	-14.7833
1.8924	5.5907	-174.20	-14.9493
1.8970	5.6936	-174.18	-15.1077
1.9016	5.7936	-174.16	-15.2590
1.9062	5.8910	-174.14	-15.4037
1.9108	5.9857	-174.12	-15.5423
1.9154	6.0779	-174.11	-15.6751
1.9200	6.1678	-174.09	-15.8026
1.9246	6.2553	-174.08	-15.9250
1.9292	6.3406	-174.06	-16.0426
1.9338	6.4238	-174.05	-16.1558
1.9383	6.5049	-174.03	-16.2648
1.9429	6.5840	-174.02	-16.3698
1.9475	6.6612	-174.01	-16.4711
1.9521	6.7365	-174.00	-16.5687
1.9567	6.8101	-173.99	-16.6630
1.9613	6.8819	-173.98	-16.7541
1.9659	6.9520	-173.97	-16.8422
1.9705	7.0205	-173.96	-16.9273
1.9751	7.0874	-173.95	-17.0097
1.9797	7.1527	-173.94	-17.0894

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7549	1.2688	13.28	-2.0679
1.7597	0.5886	20.02	4.6031
1.7646	0.1371	75.72	17.2584
1.7694	0.4071	169.33	7.8066
1.7743	0.7790	178.15	2.1691
1.7791	1.1176	-178.98	-0.9657
1.7840	1.4271	-177.55	-3.0889
1.7889	1.7125	-176.69	-4.6727
1.7937	1.9780	-176.12	-5.9244
1.7986	2.2264	-175.70	-6.9519
1.8034	2.4601	-175.38	-7.8189
1.8083	2.6809	-175.14	-8.5655
1.8132	2.8903	-174.94	-9.2187
1.8180	3.0894	-174.77	-9.7975
1.8229	3.2794	-174.63	-10.3158
1.8277	3.4609	-174.51	-10.7838
1.8326	3.6348	-174.40	-11.2096
1.8374	3.8016	-174.31	-11.5993
1.8423	3.9619	-174.23	-11.9581
1.8472	4.1162	-174.16	-12.2899
1.8520	4.2648	-174.10	-12.5980
1.8569	4.4082	-174.04	-12.8851
1.8617	4.5466	-173.99	-13.1537
1.8666	4.6804	-173.94	-13.4056
1.8715	4.8097	-173.89	-13.6424
1.8763	4.9350	-173.85	-13.8657
1.8812	5.0563	-173.81	-14.0767
1.8860	5.1740	-173.78	-14.2765
1.8909	5.2881	-173.75	-14.4659
1.8957	5.3988	-173.71	-14.6459
1.9006	5.5063	-173.69	-14.8172
1.9055	5.6107	-173.66	-14.9804
1.9103	5.7123	-173.63	-15.1361
1.9152	5.8110	-173.61	-15.2850
1.9200	5.9070	-173.59	-15.4273
1.9249	6.0004	-173.57	-15.5636
1.9297	6.0914	-173.54	-15.6943
1.9346	6.1800	-173.53	-15.8197
1.9395	6.2663	-173.51	-15.9402
1.9443	6.3503	-173.49	-16.0559
1.9492	6.4323	-173.47	-16.1673
1.9540	6.5122	-173.46	-16.2745
1.9589	6.5901	-173.44	-16.3778
1.9638	6.6660	-173.43	-16.4773
1.9686	6.7402	-173.41	-16.5734
1.9735	6.8125	-173.40	-16.6661
1.9783	6.8831	-173.39	-16.7556
1.9832	6.9520	-173.37	-16.8422
1.9880	7.0193	-173.36	-16.9258
1.9929	7.0850	-173.35	-17.0068

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7555	1.7482	15.02	-4.8519
1.7610	1.0264	19.28	-0.2266
1.7664	0.4904	30.89	6.1894
1.7719	0.1825	101.69	14.7737
1.7774	0.4511	165.24	6.9144
1.7829	0.7954	175.84	1.9881
1.7884	1.1181	179.71	-0.9693
1.7938	1.4175	-178.28	-3.0302
1.7993	1.6964	-177.06	-4.5904
1.8048	1.9575	-176.23	-5.8340
1.8103	2.2031	-175.62	-6.8609
1.8158	2.4351	-175.16	-7.7304
1.8212	2.6550	-174.80	-8.4812
1.8267	2.8639	-174.51	-9.1392
1.8322	3.0630	-174.27	-9.7230
1.8377	3.2531	-174.06	-10.2461
1.8432	3.4351	-173.89	-10.7187
1.8487	3.6094	-173.73	-11.1488
1.8541	3.7768	-173.60	-11.5425
1.8596	3.9377	-173.48	-11.9048
1.8651	4.0925	-173.38	-12.2398
1.8706	4.2417	-173.29	-12.5508
1.8761	4.3856	-173.20	-12.8406
1.8815	4.5245	-173.12	-13.1114
1.8870	4.6587	-173.05	-13.3653
1.8925	4.7884	-172.99	-13.6039
1.8980	4.9140	-172.93	-13.8286
1.9035	5.0355	-172.87	-14.0409
1.9089	5.1533	-172.82	-14.2416
1.9144	5.2674	-172.77	-14.4319
1.9199	5.3781	-172.73	-14.6125
1.9254	5.4855	-172.69	-14.7843
1.9309	5.5897	-172.65	-14.9478
1.9363	5.6910	-172.61	-15.1037
1.9418	5.7893	-172.58	-15.2526
1.9473	5.8849	-172.54	-15.3948
1.9528	5.9779	-172.51	-15.5309
1.9583	6.0682	-172.48	-15.6613
1.9637	6.1562	-172.46	-15.7862
1.9692	6.2417	-172.43	-15.9061
1.9747	6.3250	-172.40	-16.0212
1.9802	6.4061	-172.38	-16.1318
1.9857	6.4850	-172.36	-16.2382
1.9912	6.5619	-172.34	-16.3406
1.9966	6.6368	-172.31	-16.4392
2.0021	6.7098	-172.29	-16.5342
2.0076	6.7810	-172.27	-16.6258
2.0131	6.8503	-172.26	-16.7142
2.0186	6.9180	-172.24	-16.7995
2.0240	6.9839	-172.22	-16.8819

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7567	2.4335	17.97	-7.7247
1.7633	1.6421	21.23	-4.3081
1.7700	1.0476	26.98	-0.4042
1.7767	0.5748	40.77	4.8098
1.7834	0.2880	89.76	10.8112
1.7900	0.4398	151.51	7.1354
1.7967	0.7514	169.37	2.4826
1.8034	1.0643	176.06	-0.5415
1.8100	1.3614	179.49	-2.6798
1.8167	1.6414	-178.44	-4.3041
1.8234	1.9053	-177.05	-5.5991
1.8301	2.1546	-176.05	-6.6673
1.8367	2.3907	-175.29	-7.5707
1.8434	2.6149	-174.70	-8.3493
1.8501	2.8283	-174.22	-9.0305
1.8568	3.0317	-173.83	-9.6337
1.8634	3.2260	-173.50	-10.1732
1.8701	3.4118	-173.21	-10.6598
1.8768	3.5899	-172.97	-11.1016
1.8834	3.7607	-172.76	-11.5054
1.8901	3.9248	-172.57	-11.8762
1.8968	4.0825	-172.40	-12.2184
1.9035	4.2342	-172.25	-12.5355
1.9101	4.3804	-172.12	-12.8303
1.9168	4.5213	-172.00	-13.1053
1.9235	4.6573	-171.89	-13.3626
1.9301	4.7885	-171.78	-13.6040
1.9368	4.9152	-171.69	-13.8309
1.9435	5.0377	-171.60	-14.0447
1.9502	5.1562	-171.52	-14.2466
1.9568	5.2708	-171.45	-14.4375
1.9635	5.3817	-171.38	-14.6184
1.9702	5.4891	-171.31	-14.7900
1.9768	5.5932	-171.25	-14.9531
1.9835	5.6940	-171.19	-15.1083
1.9902	5.7917	-171.14	-15.2561
1.9969	5.8865	-171.09	-15.3971
2.0035	5.9784	-171.04	-15.5318
2.0102	6.0676	-171.00	-15.6604
2.0169	6.1542	-170.95	-15.7835
2.0235	6.2383	-170.91	-15.9013
2.0302	6.3199	-170.87	-16.0142
2.0369	6.3991	-170.84	-16.1224
2.0436	6.4761	-170.80	-16.2263
2.0502	6.5509	-170.77	-16.3261
2.0569	6.6236	-170.73	-16.4219
2.0636	6.6943	-170.70	-16.5141
2.0703	6.7630	-170.67	-16.6027
2.0769	6.8297	-170.64	-16.6880
2.0836	6.8946	-170.62	-16.7702

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 1.75

B	N	PHASE	-1/N(DB)
1.7582	3.0794	21.09	-9.7692
1.7664	2.2096	24.11	-6.8864
1.7746	1.5556	28.63	-3.8378
1.7828	1.0261	36.74	-0.2236
1.7910	0.6093	54.93	4.3027
1.7993	0.4022	100.14	7.9118
1.8075	0.5439	146.22	5.2889
1.8157	0.8303	164.89	1.6156
1.8239	1.1328	173.06	-1.0830
1.8321	1.4263	177.49	-3.0844
1.8403	1.7060	-179.76	-4.6394
1.8485	1.9712	-177.88	-5.8947
1.8567	2.2227	-176.52	-6.9378
1.8649	2.4615	-175.49	-7.8239
1.8731	2.6884	-174.68	-8.5898
1.8813	2.9044	-174.02	-9.2610
1.8896	3.1102	-173.48	-9.8559
1.8978	3.3067	-173.02	-10.3880
1.9060	3.4946	-172.63	-10.8679
1.9142	3.6743	-172.30	-11.3034
1.9224	3.8464	-172.00	-11.7011
1.9306	4.0115	-171.74	-12.0660
1.9388	4.1698	-171.51	-12.4024
1.9470	4.3220	-171.31	-12.7136
1.9552	4.4682	-171.12	-13.0026
1.9634	4.6088	-170.95	-13.2717
1.9716	4.7441	-170.80	-13.5231
1.9799	4.8745	-170.66	-13.7585
1.9881	5.0000	-170.53	-13.9795
1.9963	5.1211	-170.41	-14.1872
2.0045	5.2378	-170.30	-14.3830
2.0127	5.3505	-170.20	-14.5678
2.0209	5.4592	-170.10	-14.7425
2.0291	5.5641	-170.01	-14.9080
2.0373	5.6655	-169.93	-15.0648
2.0455	5.7635	-169.85	-15.2138
2.0537	5.8582	-169.77	-15.3553
2.0620	5.9497	-169.70	-15.4900
2.0702	6.0382	-169.64	-15.6182
2.0784	6.1239	-169.57	-15.7405
2.0866	6.2067	-169.51	-15.8572
2.0948	6.2868	-169.46	-15.9686
2.1030	6.3644	-169.40	-16.0751
2.1112	6.4394	-169.35	-16.1769
2.1194	6.5121	-169.30	-16.2744
2.1276	6.5825	-169.26	-16.3678
2.1358	6.6506	-169.21	-16.4572
2.1440	6.7166	-169.17	-16.5429
2.1523	6.7804	-169.13	-16.6252
2.1605	6.8423	-169.09	-16.7041

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 2.CC

B	N	PHASE	-1/N(DB)
2.0049	0.5631	12.06	4.9876
2.0097	0.0631	99.80	23.9928
2.0146	0.4366	177.39	7.1580
2.0194	0.7955	-178.89	1.9870
2.0243	1.1081	-177.60	-0.8918
2.0292	1.3883	-176.94	-2.8498
2.0340	1.6435	-176.54	-4.3156
2.0389	1.8788	-176.26	-5.4775
2.0438	2.0975	-176.06	-6.4339
2.0486	2.3022	-175.90	-7.2429
2.0535	2.4949	-175.78	-7.9412
2.0583	2.6771	-175.68	-8.5534
2.0632	2.8500	-175.59	-9.0970
2.0681	3.0146	-175.52	-9.5846
2.0729	3.1717	-175.46	-10.0259
2.0778	3.3220	-175.41	-10.4280
2.0827	3.4661	-175.36	-10.7968
2.0875	3.6045	-175.32	-11.1368
2.0924	3.7376	-175.28	-11.4517
2.0972	3.8658	-175.25	-11.7447
2.1021	3.9894	-175.22	-12.0181
2.1070	4.1088	-175.19	-12.2742
2.1118	4.2242	-175.17	-12.5148
2.1167	4.3358	-175.14	-12.7414
2.1215	4.4439	-175.12	-12.9553
2.1264	4.5486	-175.10	-13.1576
2.1313	4.6502	-175.08	-13.3495
2.1361	4.7488	-175.07	-13.5317
2.1410	4.8446	-175.05	-13.7051
2.1459	4.9376	-175.03	-13.8703
2.1507	5.0280	-175.02	-14.0279
2.1556	5.1159	-175.01	-14.1785
2.1604	5.2015	-174.99	-14.3226
2.1653	5.2848	-174.98	-14.4606
2.1702	5.3660	-174.97	-14.5930
2.1750	5.4450	-174.96	-14.7200
2.1799	5.5221	-174.95	-14.8421
2.1847	5.5972	-174.94	-14.9594
2.1896	5.6705	-174.93	-15.0724
2.1945	5.7419	-174.92	-15.1812
2.1993	5.8117	-174.91	-15.2860
2.2042	5.8798	-174.90	-15.3872
2.2091	5.9462	-174.90	-15.4848
2.2139	6.0112	-174.89	-15.5792
2.2188	6.0746	-174.88	-15.6703
2.2236	6.1365	-174.87	-15.7584
2.2285	6.1971	-174.87	-15.8437
2.2334	6.2563	-174.86	-15.9263
2.2382	6.3141	-174.85	-16.0062
2.2431	6.3707	-174.85	-16.0837

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 2.CC

B	N	PHASE	-1/N(DB)
2.0052	0.8945	12.57	0.9687
2.0105	0.3173	23.33	9.9695
2.0157	0.1682	154.26	15.4836
2.0210	0.5224	176.82	5.6397
2.0262	0.8447	-179.35	1.4663
2.0315	1.1346	-177.77	-1.0970
2.0367	1.3990	-176.90	-2.9164
2.0420	1.6427	-176.35	-4.3113
2.0472	1.8693	-175.96	-5.4337
2.0525	2.0814	-175.68	-6.3671
2.0577	2.2810	-175.46	-7.1624
2.0630	2.4696	-175.28	-7.8524
2.0682	2.6485	-175.14	-8.4599
2.0735	2.8187	-175.02	-9.0009
2.0787	2.9811	-174.91	-9.4875
2.0840	3.1364	-174.82	-9.9285
2.0892	3.2852	-174.75	-10.3311
2.0945	3.4280	-174.68	-10.7008
2.0997	3.5653	-174.62	-11.0419
2.1050	3.6975	-174.56	-11.3581
2.1102	3.8249	-174.52	-11.6523
2.1155	3.9478	-174.47	-11.9271
2.1207	4.0666	-174.43	-12.1846
2.1260	4.1814	-174.39	-12.4265
2.1312	4.2925	-174.36	-12.6543
2.1365	4.4002	-174.33	-12.8694
2.1417	4.5045	-174.30	-13.0729
2.1470	4.6057	-174.27	-13.2658
2.1522	4.7038	-174.25	-13.4490
2.1575	4.7992	-174.22	-13.6233
2.1627	4.8918	-174.20	-13.7894
2.1680	4.9818	-174.18	-13.9478
2.1732	5.0694	-174.16	-14.0991
2.1785	5.1545	-174.14	-14.2438
2.1837	5.2374	-174.12	-14.3823
2.1890	5.3181	-174.11	-14.5152
2.1942	5.3967	-174.09	-14.6426
2.1995	5.4733	-174.08	-14.7650
2.2047	5.5480	-174.06	-14.8827
2.2100	5.6207	-174.05	-14.9959
2.2152	5.6917	-174.03	-15.1049
2.2205	5.7609	-174.02	-15.2099
2.2257	5.8285	-174.01	-15.3111
2.2310	5.8944	-174.00	-15.4088
2.2362	5.9587	-173.99	-15.5031
2.2415	6.0216	-173.98	-15.5942
2.2467	6.0829	-173.97	-15.6822
2.2520	6.1428	-173.96	-15.7674
2.2572	6.2014	-173.95	-15.8497
2.2625	6.2586	-173.94	-15.9295

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 2.00

B	N	PHASE	-1/N(DB)
2.0056	1.1103	13.28	-0.9086
2.0111	0.5152	20.02	5.7612
2.0167	0.1200	75.65	18.4137
2.0222	0.3560	169.32	8.9701
2.0278	0.6814	178.15	3.3313
2.0333	0.9777	-178.98	0.1959
2.0389	1.2485	-177.55	-1.9275
2.0444	1.4982	-176.69	-3.5116
2.0500	1.7305	-176.12	-4.7633
2.0555	1.9478	-175.70	-5.7910
2.0611	2.1523	-175.38	-6.6580
2.0666	2.3455	-175.14	-7.4047
2.0722	2.5287	-174.94	-8.0579
2.0777	2.7029	-174.77	-8.6368
2.0833	2.8691	-174.63	-9.1550
2.0888	3.0280	-174.51	-9.6231
2.0944	3.1801	-174.41	-10.0489
2.0999	3.3261	-174.31	-10.4387
2.1055	3.4664	-174.23	-10.7975
2.1110	3.6013	-174.16	-11.1293
2.1166	3.7314	-174.10	-11.4374
2.1221	3.8568	-174.04	-11.7246
2.1277	3.9779	-173.99	-11.9931
2.1332	4.0950	-173.94	-12.2450
2.1388	4.2082	-173.89	-12.4819
2.1443	4.3178	-173.85	-12.7052
2.1499	4.4240	-173.81	-12.9162
2.1554	4.5269	-173.78	-13.1160
2.1610	4.6267	-173.75	-13.3054
2.1665	4.7236	-173.71	-13.4854
2.1721	4.8176	-173.69	-13.6567
2.1776	4.9090	-173.66	-13.8199
2.1832	4.9979	-173.63	-13.9757
2.1887	5.0842	-173.61	-14.1245
2.1943	5.1683	-173.59	-14.2669
2.1998	5.2500	-173.57	-14.4032
2.2054	5.3296	-173.55	-14.5339
2.2110	5.4071	-173.53	-14.6593
2.2165	5.4826	-173.51	-14.7798
2.2221	5.5562	-173.49	-14.8955
2.2276	5.6279	-173.47	-15.0069
2.2332	5.6978	-173.46	-15.1141
2.2387	5.7659	-173.44	-15.2174
2.2443	5.8324	-173.43	-15.3170
2.2498	5.8973	-173.41	-15.4130
2.2554	5.9606	-173.40	-15.5058
2.2609	6.0223	-173.39	-15.5953
2.2665	6.0826	-173.37	-15.6818
2.2720	6.1415	-173.36	-15.7655
2.2776	6.1990	-173.35	-15.8464

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 2.CC

B	N	PHASE	-1/N(DB)
2.0063	1.5296	15.02	-3.6918
2.0125	0.8981	19.29	0.9333
2.0188	0.4291	30.89	7.3495
2.0251	0.1597	101.69	15.9335
2.0313	0.3947	165.25	8.0741
2.0376	0.6960	175.84	3.1478
2.0438	0.9783	179.71	0.1905
2.0501	1.2403	-178.28	-1.8703
2.0564	1.4843	-177.06	-3.4306
2.0626	1.7128	-176.23	-4.6743
2.0689	1.9277	-175.62	-5.7010
2.0752	2.1307	-175.16	-6.5706
2.0814	2.3231	-174.80	-7.3214
2.0877	2.5059	-174.51	-7.9794
2.0940	2.6801	-174.27	-8.5631
2.1002	2.8465	-174.06	-9.0862
2.1065	3.0057	-173.89	-9.5588
2.1127	3.1582	-173.73	-9.9889
2.1190	3.3047	-173.60	-10.3826
2.1253	3.4455	-173.48	-10.7450
2.1315	3.5810	-173.38	-11.0800
2.1378	3.7115	-173.29	-11.3910
2.1441	3.8374	-173.20	-11.6807
2.1503	3.9589	-173.12	-11.9515
2.1566	4.0763	-173.05	-12.2054
2.1629	4.1899	-172.99	-12.4440
2.1691	4.2997	-172.93	-12.6688
2.1754	4.4061	-172.87	-12.8810
2.1816	4.5091	-172.82	-13.0818
2.1879	4.6090	-172.77	-13.2721
2.1942	4.7058	-172.73	-13.4527
2.2004	4.7998	-172.69	-13.6244
2.2067	4.8910	-172.65	-13.7880
2.2130	4.9796	-172.61	-13.9439
2.2192	5.0657	-172.58	-14.0927
2.2255	5.1493	-172.54	-14.2350
2.2318	5.2306	-172.51	-14.3711
2.2380	5.3097	-172.48	-14.5014
2.2443	5.3866	-172.46	-14.6264
2.2505	5.4615	-172.43	-14.7462
2.2568	5.5344	-172.40	-14.8613
2.2631	5.6053	-172.38	-14.9720
2.2693	5.6744	-172.36	-15.0784
2.2756	5.7417	-172.34	-15.1808
2.2819	5.8072	-172.31	-15.2794
2.2881	5.8711	-172.29	-15.3744
2.2944	5.9333	-172.27	-15.4660
2.3007	5.9940	-172.26	-15.5544
2.3069	6.0532	-172.24	-15.6397
2.3132	6.1109	-172.22	-15.7221

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 2.00

B	N	PHASE	-1/N(DB)
2.0076	2.1294	17.97	-6.5650
2.0152	1.4369	21.23	-3.1486
2.0229	0.9168	26.98	0.7549
2.0305	0.5030	40.77	5.9685
2.0381	0.2520	89.74	11.9706
2.0457	0.3847	151.50	8.2971
2.0534	0.6574	169.37	3.6439
2.0610	0.9312	176.06	0.6194
2.0686	1.1911	179.49	-1.5191
2.0762	1.4361	-178.44	-3.1435
2.0839	1.6670	-177.05	-4.4386
2.0915	1.8851	-176.05	-5.5069
2.0991	2.0918	-175.29	-6.4103
2.1067	2.2879	-174.70	-7.1889
2.1144	2.4746	-174.22	-7.8701
2.1220	2.6526	-173.83	-8.4734
2.1296	2.8226	-173.50	-9.0129
2.1372	2.9852	-173.21	-9.4995
2.1449	3.1410	-172.97	-9.9414
2.1525	3.2905	-172.76	-10.3451
2.1601	3.4340	-172.57	-10.7160
2.1677	3.5720	-172.40	-11.0582
2.1754	3.7048	-172.25	-11.3753
2.1830	3.8327	-172.12	-11.6701
2.1906	3.9560	-172.00	-11.9451
2.1982	4.0749	-171.89	-12.2024
2.2059	4.1898	-171.78	-12.4438
2.2135	4.3007	-171.69	-12.6707
2.2211	4.4078	-171.60	-12.8845
2.2287	4.5115	-171.52	-13.0864
2.2364	4.6118	-171.45	-13.2773
2.2440	4.7088	-171.38	-13.4582
2.2516	4.8028	-171.31	-13.6299
2.2592	4.8938	-171.25	-13.7930
2.2669	4.9821	-171.20	-13.9482
2.2745	5.0676	-171.14	-14.0960
2.2821	5.1505	-171.09	-14.2370
2.2897	5.2310	-171.04	-14.3716
2.2974	5.3090	-171.00	-14.5003
2.3050	5.3848	-170.95	-14.6234
2.3126	5.4583	-170.91	-14.7412
2.3202	5.5297	-170.87	-14.8541
2.3279	5.5991	-170.84	-14.9623
2.3355	5.6665	-170.80	-15.0662
2.3431	5.7319	-170.77	-15.1660
2.3507	5.7955	-170.73	-15.2618
2.3584	5.8573	-170.70	-15.3540
2.3660	5.9174	-170.67	-15.4427
2.3736	5.9759	-170.64	-15.5280
2.3812	6.0327	-170.62	-15.6102

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 2.00

B	N	PHASE	-1/N(DB)
2.0094	2.6944	21.09	-8.6092
2.0188	1.9334	24.11	-5.7264
2.0281	1.3611	28.63	-2.6776
2.0375	0.8978	36.74	0.9367
2.0469	0.5331	54.94	5.4633
2.0563	0.3519	100.15	9.0718
2.0657	0.4760	146.23	6.4480
2.0751	0.7266	164.89	2.7746
2.0844	0.9913	173.06	0.0762
2.0938	1.2481	177.49	-1.9251
2.1032	1.4928	-179.76	-3.4800
2.1126	1.7249	-177.88	-4.7353
2.1220	1.9450	-176.52	-5.7783
2.1314	2.1539	-175.49	-6.6644
2.1407	2.3524	-174.68	-7.4303
2.1501	2.5414	-174.02	-8.1015
2.1595	2.7215	-173.48	-8.6963
2.1689	2.8935	-173.02	-9.2285
2.1783	3.0578	-172.63	-9.7083
2.1876	3.2151	-172.30	-10.1438
2.1970	3.3657	-172.00	-10.5415
2.2064	3.5101	-171.74	-10.9064
2.2158	3.6487	-171.51	-11.2428
2.2252	3.7818	-171.31	-11.5540
2.2346	3.9097	-171.12	-11.8429
2.2439	4.0328	-170.95	-12.1121
2.2533	4.1512	-170.80	-12.3635
2.2627	4.2652	-170.66	-12.5989
2.2721	4.3751	-170.53	-12.8198
2.2815	4.4810	-170.41	-13.0276
2.2908	4.5832	-170.30	-13.2233
2.3002	4.6817	-170.20	-13.4081
2.3096	4.7769	-170.10	-13.5829
2.3190	4.8687	-170.01	-13.7483
2.3284	4.9574	-169.93	-13.9051
2.3378	5.0432	-169.85	-14.0541
2.3471	5.1260	-169.77	-14.1956
2.3565	5.2061	-169.70	-14.3303
2.3659	5.2836	-169.64	-14.4585
2.3753	5.3585	-169.57	-14.5808
2.3847	5.4309	-169.51	-14.6975
2.3941	5.5010	-169.46	-14.8089
2.4034	5.5689	-169.40	-14.9154
2.4128	5.6346	-169.35	-15.0172
2.4222	5.6982	-169.30	-15.1147
2.4316	5.7597	-169.26	-15.2080
2.4410	5.8193	-169.21	-15.2975
2.4503	5.8771	-169.17	-15.3832
2.4597	5.9330	-169.13	-15.4654
2.4691	5.9871	-169.09	-15.5444

DESCRIBING FUNCTION DATA

FREQUENCY = 15.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5061	0.4506	12.06	6.9251
2.5122	0.0505	99.72	25.9322
2.5182	0.3508	177.39	9.0980
2.5243	0.6363	-178.89	3.9263
2.5304	0.8864	-177.60	1.0472
2.5365	1.1105	-176.94	-0.9108
2.5425	1.3147	-176.54	-2.3767
2.5486	1.5029	-176.26	-3.5386
2.5547	1.6779	-176.06	-4.4951
2.5608	1.8417	-175.90	-5.3042
2.5668	1.9958	-175.78	-6.0024
2.5729	2.1416	-175.68	-6.6146
2.5790	2.2799	-175.59	-7.1583
2.5851	2.4116	-175.52	-7.6459
2.5912	2.5372	-175.46	-8.0872
2.5972	2.6575	-175.41	-8.4893
2.6033	2.7727	-175.36	-8.8581
2.6094	2.8834	-175.32	-9.1981
2.6155	2.9899	-175.28	-9.5131
2.6215	3.0924	-175.25	-9.8060
2.6276	3.1914	-175.22	-10.0795
2.6337	3.2869	-175.19	-10.3356
2.6398	3.3792	-175.17	-10.5762
2.6458	3.4685	-175.14	-10.8027
2.6519	3.5549	-175.12	-11.0167
2.6580	3.6387	-175.10	-11.2190
2.6641	3.7200	-175.08	-11.4109
2.6702	3.7989	-175.07	-11.5931
2.6762	3.8755	-175.05	-11.7665
2.6823	3.9499	-175.03	-11.9317
2.6884	4.0222	-175.02	-12.0893
2.6945	4.0926	-175.01	-12.2399
2.7005	4.1610	-174.99	-12.3840
2.7066	4.2277	-174.98	-12.5221
2.7127	4.2926	-174.97	-12.6544
2.7188	4.3558	-174.96	-12.7815
2.7248	4.4175	-174.95	-12.9035
2.7309	4.4776	-174.94	-13.0209
2.7370	4.5362	-174.93	-13.1338
2.7431	4.5934	-174.92	-13.2426
2.7491	4.6492	-174.91	-13.3475
2.7552	4.7036	-174.90	-13.4487
2.7613	4.7568	-174.90	-13.5463
2.7674	4.8087	-174.89	-13.6406
2.7735	4.8595	-174.88	-13.7318
2.7795	4.9090	-174.87	-13.8199
2.7856	4.9575	-174.87	-13.9052
2.7917	5.0048	-174.86	-13.9878
2.7978	5.0511	-174.85	-14.0678
2.8038	5.0964	-174.85	-14.1452

DESCRIBING FUNCTION DATA

FREQUENCY = 18.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5066	0.7156	12.57	2.9068
2.5131	0.2539	23.33	11.9068
2.5197	0.1345	154.25	17.4237
2.5262	0.4179	176.82	7.5787
2.5328	0.6757	-179.35	3.4050
2.5394	0.9077	-177.77	0.8416
2.5459	1.1192	-176.90	-0.9778
2.5525	1.3141	-176.35	-2.3728
2.5591	1.4954	-175.96	-3.4952
2.5656	1.6651	-175.68	-4.4286
2.5722	1.8247	-175.46	-5.2238
2.5787	1.9756	-175.28	-5.9139
2.5853	2.1187	-175.14	-6.5214
2.5919	2.2549	-175.02	-7.0625
2.5984	2.3848	-174.91	-7.5490
2.6050	2.5090	-174.82	-7.9901
2.6116	2.6281	-174.75	-8.3927
2.6181	2.7423	-174.68	-8.7623
2.6247	2.8521	-174.62	-9.1034
2.6312	2.9579	-174.56	-9.4196
2.6378	3.0598	-174.52	-9.7139
2.6444	3.1582	-174.47	-9.9887
2.6509	3.2532	-174.43	-10.2462
2.6575	3.3451	-174.39	-10.4881
2.6641	3.4340	-174.36	-10.7159
2.6706	3.5201	-174.33	-10.9310
2.6772	3.6035	-174.30	-11.1345
2.6837	3.6844	-174.27	-11.3275
2.6903	3.7630	-174.25	-11.5107
2.6969	3.8393	-174.22	-11.6849
2.7034	3.9133	-174.20	-11.8510
2.7100	3.9854	-174.18	-12.0094
2.7166	4.0554	-174.16	-12.1607
2.7231	4.1235	-174.14	-12.3054
2.7297	4.1899	-174.12	-12.4440
2.7362	4.2544	-174.11	-12.5768
2.7428	4.3173	-174.09	-12.7043
2.7494	4.3786	-174.08	-12.8267
2.7559	4.4383	-174.06	-12.9443
2.7625	4.4965	-174.05	-13.0575
2.7691	4.5533	-174.03	-13.1665
2.7756	4.6087	-174.02	-13.2715
2.7822	4.6627	-174.01	-13.3728
2.7887	4.7154	-174.00	-13.4704
2.7953	4.7669	-173.99	-13.5647
2.8019	4.8172	-173.98	-13.6558
2.8084	4.8662	-173.97	-13.7439
2.8150	4.9142	-173.96	-13.8290
2.8215	4.9610	-173.95	-13.9114
2.8281	5.0068	-173.94	-13.9911

DESCRIBING FUNCTION DATA

FREQUENCY = 20.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5069	0.8882	13.28	1.0302
2.5139	0.4120	20.02	7.7012
2.5208	0.0960	75.71	20.3555
2.5278	0.2849	169.33	10.9048
2.5347	0.5453	178.15	5.2674
2.5416	0.7823	-178.98	2.1325
2.5486	0.9989	-177.55	0.0094
2.5555	1.1987	-176.69	-1.5745
2.5625	1.3845	-176.12	-2.8261
2.5694	1.5584	-175.70	-3.8537
2.5763	1.7220	-175.38	-4.7207
2.5833	1.8766	-175.14	-5.4673
2.5902	2.0231	-174.94	-6.1205
2.5972	2.1626	-174.77	-6.6993
2.6041	2.2955	-174.63	-7.2176
2.6110	2.4226	-174.51	-7.6856
2.6180	2.5443	-174.40	-8.1114
2.6249	2.6611	-174.31	-8.5012
2.6319	2.7733	-174.23	-8.8599
2.6388	2.8813	-174.16	-9.1917
2.6457	2.9853	-174.10	-9.4998
2.6527	3.0857	-174.04	-9.7870
2.6596	3.1826	-173.99	-10.0555
2.6666	3.2762	-173.94	-10.3074
2.6735	3.3668	-173.89	-10.5443
2.6804	3.4545	-173.85	-10.7676
2.6874	3.5394	-173.81	-10.9786
2.6943	3.6217	-173.78	-11.1783
2.7013	3.7016	-173.75	-11.3678
2.7082	3.7791	-173.71	-11.5477
2.7151	3.8544	-173.69	-11.7190
2.7221	3.9275	-173.66	-11.8822
2.7290	3.9985	-173.63	-12.0380
2.7360	4.0676	-173.61	-12.1868
2.7429	4.1348	-173.59	-12.3292
2.7498	4.2003	-173.57	-12.4655
2.7568	4.2639	-173.54	-12.5962
2.7637	4.3259	-173.53	-12.7216
2.7707	4.3863	-173.51	-12.8420
2.7776	4.4452	-173.49	-12.9578
2.7845	4.5025	-173.47	-13.0692
2.7915	4.5585	-173.46	-13.1764
2.7984	4.6130	-173.44	-13.2796
2.8054	4.6662	-173.43	-13.3792
2.8123	4.7181	-173.41	-13.4753
2.8192	4.7687	-173.40	-13.5680
2.8262	4.8181	-173.39	-13.6575
2.8331	4.8663	-173.37	-13.7441
2.8401	4.9134	-173.36	-13.8277
2.8470	4.9594	-173.35	-13.9086

DESCRIBING FUNCTION DATA

FREQUENCY = 24.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5078	1.2237	15.02	-1.7536
2.5157	0.7185	19.28	2.8717
2.5235	0.3433	30.89	9.2877
2.5313	0.1278	101.69	17.8721
2.5391	0.3158	165.25	10.0122
2.5470	0.5568	175.84	5.0860
2.5548	0.7826	179.71	2.1287
2.5626	0.9922	-178.28	0.0678
2.5705	1.1875	-177.06	-1.4924
2.5783	1.3703	-176.23	-2.7361
2.5861	1.5422	-175.62	-3.7628
2.5940	1.7046	-175.16	-4.6324
2.6018	1.8585	-174.80	-5.3832
2.6096	2.0047	-174.51	-6.0412
2.6174	2.1441	-174.27	-6.6249
2.6253	2.2772	-174.06	-7.1480
2.6331	2.4045	-173.89	-7.6207
2.6409	2.5266	-173.73	-8.0507
2.6488	2.6438	-173.60	-8.4444
2.6566	2.7564	-173.48	-8.8068
2.6644	2.8648	-173.38	-9.1418
2.6723	2.9692	-173.29	-9.4528
2.6801	3.0699	-173.20	-9.7425
2.6879	3.1671	-173.12	-10.0133
2.6957	3.2611	-173.05	-10.2672
2.7036	3.3519	-172.99	-10.5058
2.7114	3.4398	-172.93	-10.7306
2.7192	3.5248	-172.87	-10.9428
2.7271	3.6073	-172.82	-11.1436
2.7349	3.6872	-172.77	-11.3339
2.7427	3.7646	-172.73	-11.5145
2.7505	3.8398	-172.69	-11.6862
2.7584	3.9128	-172.65	-11.8498
2.7662	3.9837	-172.61	-12.0057
2.7740	4.0525	-172.58	-12.1545
2.7819	4.1194	-172.54	-12.2968
2.7897	4.1845	-172.51	-12.4329
2.7975	4.2478	-172.48	-12.5632
2.8054	4.3093	-172.46	-12.6882
2.8132	4.3692	-172.43	-12.8080
2.8210	4.4275	-172.40	-12.9231
2.8288	4.4842	-172.38	-13.0338
2.8367	4.5395	-172.36	-13.1402
2.8445	4.5933	-172.34	-13.2426
2.8523	4.6458	-172.31	-13.3412
2.8602	4.6969	-172.29	-13.4362
2.8680	4.7467	-172.27	-13.5278
2.8758	4.7952	-172.26	-13.6162
2.8837	4.8426	-172.24	-13.7015
2.8915	4.8887	-172.22	-13.7839

DESCRIBING FUNCTION DATA

FREQUENCY = 30.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5095	1.7035	17.97	-4.6266
2.5191	1.1495	21.23	-1.2102
2.5286	0.7334	26.98	2.6935
2.5381	0.4024	40.77	7.9074
2.5477	0.2016	89.75	13.9090
2.5572	0.3078	151.50	10.2344
2.5667	0.5259	169.37	5.5814
2.5762	0.7450	176.06	2.5571
2.5858	0.9529	179.49	0.4187
2.5953	1.1489	-178.44	-1.2057
2.6048	1.3336	-177.05	-2.5007
2.6144	1.5082	-176.05	-3.5689
2.6239	1.6735	-175.29	-4.4723
2.6334	1.8304	-174.70	-5.2509
2.6430	1.9797	-174.22	-5.9322
2.6525	2.1221	-173.83	-6.5354
2.6620	2.2581	-173.50	-7.0750
2.6716	2.3882	-173.21	-7.5615
2.6811	2.5129	-172.97	-8.0034
2.6906	2.6324	-172.76	-8.4071
2.7002	2.7473	-172.57	-8.7780
2.7097	2.8577	-172.40	-9.1202
2.7192	2.9639	-172.25	-9.4372
2.7287	3.0662	-172.12	-9.7321
2.7383	3.1649	-172.00	-10.0071
2.7478	3.2600	-171.89	-10.2644
2.7573	3.3519	-171.78	-10.5057
2.7669	3.4406	-171.69	-10.7326
2.7764	3.5263	-171.60	-10.9465
2.7859	3.6093	-171.52	-11.1483
2.7955	3.6895	-171.45	-11.3393
2.8050	3.7671	-171.38	-11.5202
2.8145	3.8423	-171.31	-11.6918
2.8241	3.9151	-171.25	-11.8549
2.8336	3.9857	-171.19	-12.0101
2.8431	4.0541	-171.14	-12.1580
2.8526	4.1205	-171.09	-12.2990
2.8622	4.1848	-171.04	-12.4336
2.8717	4.2473	-171.00	-12.5622
2.8812	4.3079	-170.95	-12.6853
2.8908	4.3667	-170.91	-12.8031
2.9003	4.4238	-170.87	-12.9160
2.9098	4.4793	-170.84	-13.0243
2.9194	4.5332	-170.80	-13.1282
2.9289	4.5856	-170.77	-13.2279
2.9384	4.6365	-170.73	-13.3238
2.9480	4.6859	-170.70	-13.4159
2.9575	4.7340	-170.67	-13.5046
2.9670	4.7807	-170.64	-13.5899
2.9766	4.8262	-170.62	-13.6721

DESCRIBING FUNCTION DATA

FREQUENCY = 36.0

ALPHA = 2.50

B	N	PHASE	-1/N(DB)
2.5117	2.1555	21.09	-6.6711
2.5235	1.5468	24.11	-3.7884
2.5352	1.0889	28.63	-0.7398
2.5469	0.7183	36.74	2.8743
2.5586	0.4266	54.93	7.4006
2.5704	0.2815	100.14	11.0098
2.5821	0.3807	146.22	8.3872
2.5938	0.5812	164.89	4.7138
2.6055	0.7929	173.06	2.0152
2.6173	0.9984	177.49	0.0138
2.6290	1.1942	-179.76	-1.5412
2.6407	1.3798	-177.89	-2.7965
2.6525	1.5559	-176.52	-3.8396
2.6642	1.7230	-175.49	-4.7258
2.6759	1.8818	-174.68	-5.4917
2.6876	2.0330	-174.02	-6.1629
2.6994	2.1771	-173.48	-6.7577
2.7111	2.3147	-173.02	-7.2899
2.7228	2.4462	-172.63	-7.7697
2.7345	2.5720	-172.30	-8.2053
2.7463	2.6925	-172.00	-8.6030
2.7580	2.8080	-171.74	-8.9679
2.7697	2.9189	-171.51	-9.3043
2.7815	3.0253	-171.31	-9.6155
2.7932	3.1277	-171.12	-9.9045
2.8049	3.2261	-170.95	-10.1736
2.8166	3.3209	-170.80	-10.4250
2.8284	3.4121	-170.66	-10.6604
2.8401	3.5000	-170.53	-10.8813
2.8518	3.5847	-170.41	-11.0891
2.8635	3.6664	-170.30	-11.2849
2.8753	3.7453	-170.20	-11.4697
2.8870	3.8214	-170.10	-11.6444
2.8987	3.8949	-170.01	-11.8099
2.9105	3.9659	-169.93	-11.9667
2.9222	4.0344	-169.85	-12.1156
2.9339	4.1007	-169.77	-12.2572
2.9456	4.1648	-169.70	-12.3919
2.9574	4.2267	-169.64	-12.5201
2.9691	4.2867	-169.57	-12.6424
2.9808	4.3446	-169.51	-12.7591
2.9925	4.4007	-169.46	-12.8705
3.0043	4.4550	-169.40	-12.9770
3.0160	4.5076	-169.35	-13.0788
3.0277	4.5584	-169.30	-13.1763
3.0395	4.6077	-169.26	-13.2697
3.0512	4.6554	-169.21	-13.3591
3.0629	4.7016	-169.17	-13.4448
3.0746	4.7463	-169.13	-13.5271
3.0864	4.7896	-169.09	-13.6060

DESCRIBING FUNCTION DATA

FREQUENCY = 22.6

ALPHA = 0.80

B	N	PHASE	-1/N(DB)
0.8024	3.4615	14.38	-10.7853
0.8048	1.9153	19.18	-5.6446
0.8072	0.7786	35.61	2.1741
0.8096	0.4644	138.80	6.6629
0.8120	1.2193	171.65	-1.7223
0.8144	1.9740	178.21	-5.9071
0.8168	2.6708	-179.06	-8.5328
0.8192	3.3153	-177.57	-10.4104
0.8216	3.9150	-176.62	-11.8547
0.8240	4.4764	-175.96	-13.0185
0.8264	5.0044	-175.48	-13.9871
0.8288	5.5032	-175.10	-14.8122
0.8312	5.9759	-174.81	-15.5281
0.8336	6.4253	-174.56	-16.1579
0.8360	6.8537	-174.36	-16.7185
0.8384	7.2630	-174.19	-17.2223
0.8408	7.6547	-174.04	-17.6785
0.8432	8.0302	-173.91	-18.0946
0.8456	8.3909	-173.80	-18.4762
0.8480	8.7377	-173.70	-18.8280
0.8504	9.0716	-173.61	-19.1537
0.8528	9.3935	-173.53	-19.4566
0.8552	9.7041	-173.46	-19.7391
0.8576	10.0040	-173.39	-20.0034
0.8600	10.2939	-173.33	-20.2516
0.8624	10.5743	-173.28	-20.4850
0.8648	10.8457	-173.23	-20.7052
0.8672	11.1087	-173.18	-20.9132
0.8696	11.3635	-173.13	-21.1102
0.8720	11.6106	-173.09	-21.2971
0.8744	11.8504	-173.05	-21.4746
0.8768	12.0831	-173.02	-21.6436
0.8792	12.3092	-172.98	-21.8046
0.8816	12.5288	-172.95	-21.9582
0.8840	12.7423	-172.92	-22.1049
0.8864	12.9499	-172.89	-22.2453
0.8888	13.1518	-172.87	-22.3797
0.8912	13.3482	-172.84	-22.5085
0.8936	13.5394	-172.82	-22.6320
0.8960	13.7256	-172.79	-22.7506
0.8984	13.9068	-172.77	-22.8645
0.9008	14.0834	-172.75	-22.9741
0.9032	14.2554	-172.73	-23.0796
0.9056	14.4231	-172.71	-23.1812
0.9080	14.5865	-172.69	-23.2790
0.9104	14.7458	-172.67	-23.3734
0.9128	14.9012	-172.66	-23.4644
0.9152	15.0527	-172.64	-23.5523
0.9176	15.2005	-172.63	-23.6372
0.9200	15.3447	-172.61	-23.7192

DESCRIBING FUNCTION DATA

FREQUENCY = 22.6

ALPHA = 1.30

B	N	PHASE	-1/N(DB)
1.3039	2.1302	14.38	-6.5682
1.3078	1.1787	19.18	-1.4281
1.3117	0.4792	35.60	6.3905
1.3156	0.2857	138.79	10.8811
1.3195	0.7503	171.65	2.4957
1.3234	1.2147	178.21	-1.6894
1.3273	1.6435	-179.06	-4.3153
1.3312	2.0401	-177.57	-6.1929
1.3351	2.4092	-176.62	-7.6373
1.3390	2.7546	-175.96	-8.8013
1.3429	3.0796	-175.48	-9.7698
1.3468	3.3865	-175.10	-10.5949
1.3507	3.6774	-174.81	-11.3108
1.3546	3.9540	-174.56	-11.9407
1.3585	4.2176	-174.36	-12.5013
1.3624	4.4694	-174.19	-13.0050
1.3663	4.7105	-174.04	-13.4613
1.3702	4.9416	-173.91	-13.8773
1.3741	5.1635	-173.80	-14.2589
1.3780	5.3770	-173.70	-14.6107
1.3819	5.5825	-173.61	-14.9365
1.3858	5.7805	-173.53	-15.2393
1.3897	5.9716	-173.46	-15.5219
1.3936	6.1562	-173.39	-15.7862
1.3975	6.3346	-173.33	-16.0344
1.4014	6.5072	-173.28	-16.2678
1.4053	6.6742	-173.23	-16.4880
1.4092	6.8360	-173.18	-16.6960
1.4131	6.9928	-173.13	-16.8930
1.4170	7.1449	-173.09	-17.0799
1.4209	7.2924	-173.05	-17.2574
1.4248	7.4357	-173.02	-17.4264
1.4287	7.5748	-172.98	-17.5874
1.4326	7.7100	-172.95	-17.7410
1.4365	7.8413	-172.92	-17.8878
1.4403	7.9691	-172.89	-18.0281
1.4442	8.0933	-172.87	-18.1625
1.4481	8.2142	-172.84	-18.2913
1.4520	8.3318	-172.82	-18.4148
1.4559	8.4464	-172.79	-18.5334
1.4598	8.5579	-172.77	-18.6474
1.4637	8.6666	-172.75	-18.7570
1.4676	8.7725	-172.73	-18.8624
1.4715	8.8756	-172.71	-18.9640
1.4754	8.9762	-172.69	-19.0619
1.4793	9.0743	-172.67	-19.1562
1.4832	9.1699	-172.66	-19.2473
1.4871	9.2631	-172.64	-19.3351
1.4910	9.3541	-172.63	-19.4200
1.4949	9.4428	-172.61	-19.5020

DESCRIBING FUNCTION DATA

FREQUENCY = 22.6

ALPHA = 1.50

B	N	PHASE	-1/N(DB)
1.5045	1.8462	14.38	-5.3254
1.5090	1.0215	19.18	-0.1851
1.5135	0.4153	35.60	7.6331
1.5180	0.2476	138.80	12.1235
1.5225	0.6503	171.65	3.7382
1.5270	1.0528	178.21	-0.4467
1.5315	1.4244	-179.06	-3.0726
1.5360	1.7681	-177.57	-4.9502
1.5405	2.0880	-176.62	-6.3945
1.5450	2.3874	-175.96	-7.5584
1.5495	2.6690	-175.48	-8.5269
1.5540	2.9350	-175.10	-9.3521
1.5585	3.1871	-174.81	-10.0680
1.5630	3.4268	-174.56	-10.6978
1.5675	3.6553	-174.36	-11.2584
1.5720	3.8736	-174.19	-11.7622
1.5765	4.0825	-174.04	-12.2184
1.5810	4.2828	-173.91	-12.6345
1.5855	4.4751	-173.80	-13.0161
1.5900	4.6601	-173.70	-13.3679
1.5945	4.8382	-173.61	-13.6936
1.5990	5.0098	-173.53	-13.9965
1.6035	5.1755	-173.46	-14.2790
1.6080	5.3354	-173.39	-14.5434
1.6125	5.4900	-173.33	-14.7915
1.6170	5.6396	-173.28	-15.0249
1.6215	5.7844	-173.23	-15.2451
1.6260	5.9246	-173.18	-15.4531
1.6305	6.0605	-173.13	-15.6502
1.6350	6.1923	-173.09	-15.8370
1.6395	6.3202	-173.05	-16.0146
1.6440	6.4443	-173.02	-16.1835
1.6484	6.5649	-172.98	-16.3445
1.6529	6.6820	-172.95	-16.4981
1.6574	6.7959	-172.92	-16.6449
1.6619	6.9066	-172.89	-16.7852
1.6664	7.0142	-172.87	-16.9196
1.6709	7.1190	-172.84	-17.0484
1.6754	7.2210	-172.82	-17.1719
1.6799	7.3203	-172.79	-17.2905
1.6844	7.4169	-172.77	-17.4045
1.6889	7.5111	-172.75	-17.5141
1.6934	7.6029	-172.73	-17.6195
1.6979	7.6923	-172.71	-17.7211
1.7024	7.7794	-172.69	-17.8190
1.7069	7.8644	-172.67	-17.9133
1.7114	7.9473	-172.66	-18.0043
1.7159	8.0281	-172.64	-18.0922
1.7204	8.1069	-172.63	-18.1771
1.7249	8.1838	-172.61	-18.2591

APPENDIX II

Computer program for simulation followed by numerical Data.

```
C(1)=MAXIMUM VALUE OF INPUT SINE WAVE
C(2)=VALUE OF FILTER INDUCTANCE IN HENRIES
C(3)=VALUE OF FILTER CAPICITANCE IN FARADS
C(4)=VALUE OF LOAD RESISTANCE IN OHMS
C(5)=REFERENCE VOLTAGE
C(6)=GAIN OF AMPLIFIER BEFORE DEAD ZONE
C(7)=MAGNITUDE OF DEAD ZONE
C(8)=GAIN OF AMPLIFIER AFTER DEAD ZONE

*****----*****----*****----*****----*****----*****----*****----

      DIMENSION X(30),XDOT(30),C(15)
      C(10)=1.
      IBP=1
      PI=3.141592
    1 CALL INTEG2(T,X,XDOT,C)
      XMAX=C(1)*SIN(PI/3.)
      THA=2.0*PI*60.0*T
      PHASEA=ABS(C(1)*SIN(THA))
      PHASEB=ABS(C(1)*SIN(THA+2.0*PI/3.))
      PHASEC=ABS(C(1)*SIN(THA+PI/3.))
      X(6)=AMAX1(PHASEA,PHASEB,PHASEC)
      IF(PHASEA.GE.XMAX)IPH=1
      IF(PHASEB.GE.XMAX)IPH=2
      IF(PHASEC.GE.XMAX)IPH=3
  206 ERROR=X(1)-C(5)
      X(8)=IPH
      VK1=C(6)*ERROR
      IF(VK1.GE.C(7))VDZ=VK1
      IF(VK1.LT.C(7))VDZ=0.0
      IF(VK1.LT.0.0)VDZ=VK1
      VK2=VDZ*C(8)
      GO TO(100,101,102,103,104),IBP
  100 CONTINUE
      IF(VK2)207,207,208
  207 IBP=1
      VIN=X(6)
      X(5)=VIN
      X(7)=0.
      X(3)=(1./C(2))*(VIN-X(1))
      XDOT(2)=X(3)
      X(4)=(1./C(3))*X(2)-(1./(C(3)*C(4)))*X(1)
      XDOT(1)=X(4)
      VLAST=VIN
      GO TO 1
  208 IF(VIN.LT.VLAST)GO TO 207
      GO TO(101,102,103),IPH
  101 VIN=PHASEA
      IF(VK2)207,207,105
  105 CONTINUE
      X(7)=1.
      X(5)=VIN
      IF(VIN-.75)300,301,301
  300 VIN=0.0
      X(5)=VIN
      IBP=5
      GO TO 302
  301 IBP=2
  302 X(3)=(1./C(2))*(VIN-X(1))
      IF(X(2).LT.-0.01)X(3)=0.0
      XDOT(2)=X(3)
      IF(X(2).LT.-0.01) X(2)=-0.01
      X(4)=(1./C(3))*X(2)-(1./(C(3)*C(4)))*X(1)
      XDOT(1)=X(4)
      VLAST=VIN
      GO TO 1
  102 VIN=PHASEB
```

```
      IF(VK2)207,207,106
  106 CONTINUE
      X(7)=2.
      X(5)=VIN
      IF(VIN-.75)303,304,304
  303 VIN=0.0
      X(5)=VIN
      IBP=5
      GO TO 305
  304 IBP=3
  305 X(3)=(1./C(2))*(VIN-X(1))
      IF(X(2).LT.-0.01)X(3)=0.0
      XDOT(2)=X(3)
      IF(X(2).LT.-0.01) X(2)=-0.01
      X(4)=(1./C(3))*X(2)-(1./(C(3)*C(4)))*X(1)
      XDOT(1)=X(4)
      VLAST=VIN
      GO TO 1
  103 VIN=PHASEC
      IF(VK2)207,207,107
  107 CONTINUE
      X(7)=3.
      X(5)=VIN
      IF(VIN-.75)306,307,307
  306 VIN=0.0
      X(5)=VIN
      IBP=5
      GO TO 308
  307 IBP=4
  308 X(3)=(1./C(2))*(VIN-X(1))
      IF(X(2).LT.-0.01)X(3)=0.0
      XDOT(2)=X(3)
      IF(X(2).LT.-0.01) X(2)=-0.01
      X(4)=(1./C(3))*X(2)-(1./(C(3)*C(4)))*X(1)
      XDOT(1)=X(4)
      VLAST=VIN
      GO TO 1
  104 VIN=0.0
      X(7)=4.
      X(5)=VIN
      X(3)=(1./C(2))*(VIN-X(1))
      IF(X(2).LT.-0.01)X(3)=0.0
      XDOT(2)=X(3)
      IF(X(2).LT.-0.01) X(2)=-0.01
      X(4)=(1./C(3))*X(2)-(1./(C(3)*C(4)))*X(1)
      XDOT(1)=X(4)
      IBP=5
      IF(VK2)309,309,310
  309 IBP=1
  310 CONTINUE
      GO TO 1
      END
```

```
INPUT DATA RECORD FOR RUN NUMBER 1

ORDER OF EQUATIONS =  2
INITIAL TIME       = 0.0
FINAL TIME         = 0.3700E 00
STEP SIZE          = 0.8320E-04

THE NON-ZERO CONSTANTS, C(I), ARE
              C( 1) = 0.6500E 02
              C( 2) = 0.5000E-03
              C( 3) = 0.1000E 00
              C( 4) = 0.1600E 01
              C( 5) = 0.5800E 02
              C( 6) = 0.1000E 01
              C( 8) = 0.1000E 01

THE NON-ZERO INITIAL CONDITIONS ARE
              X( 1) = 0.5700E 02
              X( 2) = 0.3600E 02


THE COLUMN HEADINGS AND THE CORRESPONDING VARIABLES ARE

         TIME         X( 0)
         VIN          X( 5)
         VOUT         X( 1)
```

TIME	VIN	VOUT
0.0	0.56292E 02	0.57000E 02
0.16640E-02	0.64651E 02	0.57120E 02
0.33280E-02	0.61778E 02	0.57550E 02
0.49920E-02	0.61879E 02	0.58208E 02
0.66559E-02	0.38419E 02	0.58951E 02
0.83198E-02	0.0	0.58695E 02
0.99838E-02	0.0	0.58087E 02
0.11648E-01	0.61673E 02	0.57507E 02
0.13312E-01	0.61981E 02	0.57156E 02
0.14976E-01	0.64579E 02	0.57066E 02
0.16640E-01	0.56622E 02	0.57289E 02
0.18303E-01	0.64716E 02	0.57722E 02
0.19967E-01	0.48836E 02	0.58419E 02
0.21631E-01	0.14361E 02	0.58503E 02
0.23295E-01	0.64540E 02	0.57898E 02
0.24959E-01	0.56785E 02	0.57508E 02
0.26623E-01	0.64747E 02	0.57321E 02
0.28287E-01	0.61459E 02	0.57438E 02
0.29951E-01	0.62179E 02	0.57789E 02
0.31615E-01	0.64499E 02	0.58362E 02
0.33279E-01	0.56947E 02	0.59169E 02
0.34943E-01	0.27712E 02	0.59744E 02
0.36607E-01	0.0	0.59222E 02
0.38271E-01	0.0	0.58609E 02
0.39935E-01	0.0	0.58002E 02
0.41599E-01	0.57108E 02	0.57519E 02
0.43263E-01	0.64802E 02	0.57240E 02
0.44926E-01	0.61238E 02	0.57272E 02
0.46590E-01	0.62371E 02	0.57544E 02
0.48254E-01	0.64413E 02	0.58056E 02
0.49918E-01	0.57267E 02	0.58818E 02
0.51582E-01	0.28316E 02	0.59383E 02
0.53246E-01	0.0	0.58871E 02
0.54910E-01	0.0	0.58261E 02
0.56574E-01	0.64367E 02	0.57658E 02
0.58238E-01	0.57424E 02	0.57319E 02
0.59902E-01	0.64851E 02	0.57194E 02
0.61566E-01	0.61010E 02	0.57383E 02
0.63229E-01	0.62559E 02	0.57802E 02
0.64892E-01	0.40310E 02	0.58366E 02
0.66555E-01	0.27300E 01	0.58067E 02
0.68218E-01	0.64878E 02	0.57541E 02
0.69881E-01	0.60857E 02	0.57315E 02
0.71544E-01	0.62680E 02	0.57326E 02
0.73207E-01	0.64248E 02	0.57595E 02
0.74870E-01	0.57815E 02	0.58138E 02
0.76533E-01	0.29394E 02	0.58554E 02
0.78196E-01	0.0	0.58023E 02
0.79859E-01	0.62799E 02	0.57570E 02
0.81522E-01	0.64177E 02	0.57368E 02

TIME	VIN	VOUT
0.83185E-01	0.58021E 02	0.57456E 02
0.84848E-01	0.64927E 02	0.57748E 02
0.86511E-01	0.50775E 02	0.58315E 02
0.88174E-01	0.17312E 02	0.58376E 02
0.89837E-01	0.64104E 02	0.57784E 02
0.91500E-01	0.58224E 02	0.57452E 02
0.93163E-01	0.64947E 02	0.57330E 02
0.94826E-01	0.60366E 02	0.57516E 02
0.96489E-01	0.63026E 02	0.57919E 02
0.98152E-01	0.41716E 02	0.58485E 02
0.99815E-01	0.45398E 01	0.58218E 02
0.10148E 00	0.64964E 02	0.57652E 02
0.10314E 00	0.60197E 02	0.57367E 02
0.10480E 00	0.63136E 02	0.57310E 02
0.10647E 00	0.63948E 02	0.57522E 02
0.10813E 00	0.58621E 02	0.58005E 02
0.10979E 00	0.31000E 02	0.58411E 02
0.11146E 00	0.60024E 02	0.57886E 02
0.11312E 00	0.63242E 02	0.57395E 02
0.11478E 00	0.63865E 02	0.57176E 02
0.11644E 00	0.58816E 02	0.57249E 02
0.11811E 00	0.64988E 02	0.57542E 02
0.11977E 00	0.51887E 02	0.58125E 02
0.12143E 00	0.19052E 02	0.58267E 02
0.12310E 00	0.63779E 02	0.57652E 02
0.12476E 00	0.59007E 02	0.57280E 02
0.12642E 00	0.64995E 02	0.57131E 02
0.12809E 00	0.59671E 02	0.57304E 02
0.12975E 00	0.63445E 02	0.57698E 02
0.13141E 00	0.63690E 02	0.58341E 02
0.13307E 00	0.59196E 02	0.59200E 02
0.13474E 00	0.32188E 02	0.59944E 02
0.13640E 00	0.0	0.59537E 02
0.13806E 00	0.0	0.58921E 02
0.13973E 00	0.0	0.58311E 02
0.14139E 00	0.59381E 02	0.57718E 02
0.14305E 00	0.65000E 02	0.57253E 02
0.14471E 00	0.59306E 02	0.57106E 02
0.14638E 00	0.63636E 02	0.57192E 02
0.14804E 00	0.63503E 02	0.57562E 02
0.14970E 00	0.59564E 02	0.58189E 02
0.15137E 00	0.32972E 02	0.58779E 02
0.15303E 00	0.0	0.58345E 02
0.15469E 00	0.63727E 02	0.57770E 02
0.15636E 00	0.63404E 02	0.57397E 02
0.15802E 00	0.59744E 02	0.57297E 02
0.15968E 00	0.64992E 02	0.57422E 02
0.16134E 00	0.58929E 02	0.57849E 02
0.16301E 00	0.63815E 02	0.58460E 02
0.16467E 00	0.44430E 02	0.59245E 02

TIME	VIN	VOUT
0.16633E 00	0.81475E 01	0.59187E 02
0.16800E 00	0.0	0.58574E 02
0.16966E 00	0.58736E 02	0.57967E 02
0.17132E 00	0.63899E 02	0.57483E 02
0.17299E 00	0.63199E 02	0.57279E 02
0.17465E 00	0.60095E 02	0.57348E 02
0.17631E 00	0.64972E 02	0.57641E 02
0.17797E 00	0.53735E 02	0.58221E 02
0.17964E 00	0.22060E 02	0.58452E 02
0.18130E 00	0.63091E 02	0.57850E 02
0.18296E 00	0.60267E 02	0.57445E 02
0.18463E 00	0.64957E 02	0.57266E 02
0.18629E 00	0.58342E 02	0.57399E 02
0.18795E 00	0.64059E 02	0.57740E 02
0.18962E 00	0.45413E 02	0.58311E 02
0.19128E 00	0.94939E 01	0.58161E 02
0.19294E 00	0.64939E 02	0.57569E 02
0.19460E 00	0.58141E 02	0.57267E 02
0.19627E 00	0.64134E 02	0.57184E 02
0.19793E 00	0.62867E 02	0.57397E 02
0.19959E 00	0.60601E 02	0.57867E 02
0.20126E 00	0.35286E 02	0.58374E 02
0.20292E 00	0.57937E 02	0.57948E 02
0.20458E 00	0.64207E 02	0.57460E 02
0.20624E 00	0.62750E 02	0.57259E 02
0.20791E 00	0.60763E 02	0.57325E 02
0.20957E 00	0.64894E 02	0.57623E 02
0.21123E 00	0.54734E 02	0.58207E 02
0.21290E 00	0.23757E 02	0.58497E 02
0.21456E 00	0.62631E 02	0.57904E 02
0.21622E 00	0.60922E 02	0.57478E 02
0.21789E 00	0.64866E 02	0.57282E 02
0.21955E 00	0.57520E 02	0.57397E 02
0.22121E 00	0.64341E 02	0.57717E 02
0.22287E 00	0.46692E 02	0.58282E 02
0.22454E 00	0.11284E 02	0.58173E 02
0.22620E 00	0.64836E 02	0.57600E 02
0.22786E 00	0.57308E 02	0.57320E 02
0.22953E 00	0.64404E 02	0.57254E 02
0.23119E 00	0.62382E 02	0.57486E 02
0.23285E 00	0.61232E 02	0.57962E 02
0.23452E 00	0.36795E 02	0.58503E 02
0.23618E 00	0.0	0.58115E 02
0.23784E 00	0.64464E 02	0.57601E 02
0.23950E 00	0.62253E 02	0.57369E 02
0.24117E 00	0.61383E 02	0.57390E 02
0.24283E 00	0.64765E 02	0.57647E 02
0.24449E 00	0.55690E 02	0.58187E 02
0.24616E 00	0.25435E 02	0.58484E 02
0.24782E 00	0.62121E 02	0.57898E 02

TIME	VIN	VOUT
0.24948E 00	0.61531E 02	0.57454E 02
0.25114E 00	0.64725E 02	0.5725CE 02
0.25281E 00	0.56654E 02	0.57354E 02
0.25447E 00	0.64574E 02	0.57664E 02
0.25613E 00	0.47935E 02	0.58235E 02
0.25780E 00	0.13065E 02	0.58180E 02
0.25946E 00	0.64681E 02	0.57594E 02
0.26112E 00	0.5643CE 02	0.57294E 02
0.26279E 00	0.64624E 02	0.572C9E 02
0.26445E 00	0.61849E 02	0.57430E 02
0.26611E 00	0.61817E 02	0.578C0E 02
0.26777E 00	0.38274E 02	0.58450E 02
0.26944E 00	0.C	0.58102E 02
0.27110E 00	0.64671E 02	0.57576E 02
0.27276E 00	0.61708E 02	0.57338E 02
0.27443E 00	0.61955E 02	0.57347E 02
0.27609E 00	0.64586E 02	0.576C3E 02
0.27775E 00	0.56603E 02	0.58139E 02
0.27942E 00	0.27093E 02	0.58484E 02
0.28108E 00	0.61564E 02	0.57915E 02
0.28274E 00	0.62091E 02	0.57455E 02
0.28440E 00	0.64533E 02	0.57242E 02
0.28607E 00	0.56825E 02	0.57334E 02
0.28773E 00	0.64756E 02	0.57633E 02
0.28939E 00	0.49140E 02	0.58205E 02
0.29106E 00	0.14835E 02	0.58201E 02
0.29272E 00	0.64477E 02	0.576C3E 02
0.29438E 00	0.57043E 02	0.57282E 02
0.29605E 00	0.64794E 02	0.57177E 02
0.29771E 00	0.61267E 02	0.57384E 02
0.29937E 00	0.62353E 02	0.57825E 02
0.30103E 00	0.39724E 02	0.58398E 02
0.30270E 00	0.19877E 01	0.58090E 02
0.30436E 00	0.64828E 02	0.57546E 02
0.30602E 00	0.61114E 02	0.57296E 02
0.30769E 00	0.62480E 02	0.57287E 02
0.30935E 00	0.64356E 02	0.57536E 02
0.31101E 00	0.57472E 02	0.58064E 02
0.31267E 00	0.28730E 02	0.58451E 02
0.31434E 00	0.60958E 02	0.579C1E 02
0.31600E 00	0.62603E 02	0.57428E 02
0.31766E 00	0.64291E 02	0.57211E 02
0.31933E 00	0.57682E 02	0.57295E 02
0.32099E 00	0.64888E 02	0.57591E 02
0.32265E 00	0.50308E 02	0.58168E 02
0.32432E 00	0.16594E 02	0.58223E 02
0.32598E 00	0.64222E 02	0.57619E 02
0.32764E 00	0.57890E 02	0.57281E 02
0.32930E 00	0.64913E 02	0.57160E 02
0.33097E 00	0.60638E 02	0.57357E 02

TIME	VIN	VCUT
0.33263E 00	0.62841E 02	0.57781E 02
0.33429E 00	0.41144E 02	0.58366E 02
0.33596E 00	0.37986E 01	0.58101E 02
0.33762E 00	0.64935E 02	0.57568E 02
0.33928E 00	0.60473E 02	0.57333E 02
0.34095E 00	0.62955E 02	0.57331E 02
0.34261E 00	0.64076E 02	0.57592E 02
0.34427E 00	0.58296E 02	0.58123E 02
0.34593E 00	0.30344E 02	0.58553E 02
0.34760E 00	0.0	0.58035E 02
0.34926E 00	0.63066E 02	0.57538E 02
0.35092E 00	0.63999E 02	0.57296E 02
0.35259E 00	0.58496E 02	0.57345E 02
0.35425E 00	0.64969E 02	0.57606E 02
0.35591E 00	0.51436E 02	0.58153E 02
0.35757E 00	0.18340E 02	0.58236E 02
0.35924E 00	0.63918E 02	0.57627E 02
0.36090E 00	0.58691E 02	0.57273E 02
0.36256E 00	0.64981E 02	0.57142E 02
0.36423E 00	0.59961E 02	0.57330E 02
0.36589E 00	0.63280E 02	0.57741E 02
0.36755E 00	0.42531E 02	0.58338E 02
0.36922E 00	0.56065E 01	0.58118E 02

```
INPUT DATA RECORD FOR RUN NUMBER 2

ORDER OF EQUATIONS =  2
INITIAL TIME       = 0.0
FINAL TIME         = 0.10000 00
STEP SIZE          = 0.22220-04

THE NON-ZERO CONSTANTS, C(I), ARE
          C( 1) = 0.6500E 02
          C( 2) = 0.5000E-03
          C( 3) = 0.1000E 00
          C( 4) = 0.1600E 01
          C( 5) = 0.6000E 02
          C( 6) = 0.1000E 01
          C( 8) = 0.1000E 01

THE NON-ZERO INITIAL CONDITIONS ARE
          X( 1) = 0.5800E 02
          X( 2) = 0.3700E 02


THE COLUMN HEADINGS AND THE CORRESPONDING VARIABLES ARE

          TIME        X( 0)
          VIN         X( 5)
          VOUT        X( 1)
```

TIME	VIN	VCUT
0.0	0.56292E 02	0.58CCCE 02
0.44440E-03	0.60923E 02	0.58C3E 02
0.88880E-03	0.63848E 02	0.58017E 02
0.13332E-02	0.64986E 02	0.58054E 02
0.17776E-02	0.643C3E 02	0.58117E 02
0.22220E-02	0.61820E 02	0.582C3E 02
0.26664E-02	0.576C6E 02	0.583C3E 02
0.31108E-02	0.59918E 02	0.584C3E 02
0.35552E-02	0.63281E 02	0.585C8E 02
0.39996E-02	0.64871E 02	0.58631E 02
0.44439E-02	0.64645E 02	0.58777E 02
0.48883E-02	0.62610E 02	0.58946E 02
0.53326E-02	0.58821E 02	0.59128E 02
0.57770E-02	0.588C5E 02	0.593C8E 02
0.62213E-02	0.626CCE 02	0.59487E 02
0.66657E-02	0.64641E 02	0.59677E 02
0.71101E-02	0.64873E 02	0.59885E 02
0.75544E-02	0.63289E 02	0.60111E 02
0.79988E-02	0.59933E 02	0.60349E 02
0.84431E-02	0.54899E 02	0.60584E 02
0.88875E-02	0.48328E 02	0.60796E 02
0.93318E-02	0.40404E 02	0.60957E 02
0.97762E-02	0.31349E 02	0.61037E 02
0.10221E-01	0.21416E 02	0.60999E 02
0.10665E-01	0.10884E 02	0.60840E 02
0.11109E-01	0.0	0.60672E 02
0.11554E-01	0.0	0.6C5C3E 02
0.11998E-01	0.0	0.60335E 02
0.12442E-01	0.0	0.60168E 02
0.12887E-01	0.0	0.60000E 02
0.13331E-01	0.61837E 02	0.59839E 02
0.13775E-01	0.57631E 02	0.59686E 02
0.14220E-01	0.59897E 02	0.59527E 02
0.14664E-01	0.63268E 02	0.59370E 02
0.15108E-01	0.64867E 02	0.59228E 02
0.15553E-01	0.64651E 02	0.59108E 02
0.15997E-01	0.62625E 02	0.590C9E 02
0.16441E-01	0.58845E 02	0.58925E 02
0.16886E-01	0.58781E 02	0.58841E 02
0.17330E-01	0.62584E 02	0.58757E 02
0.17775E-01	0.64635E 02	0.58688E 02
0.18219E-01	0.64877E 02	0.58642E 02
0.18663E-01	0.63302E 02	0.58620E 02
0.19108E-01	0.59955E 02	0.58616E 02
0.19552E-01	0.57562E 02	0.58617E 02
0.19996E-01	0.61790E 02	0.58616E 02
0.20441E-01	0.64289E 02	0.58627E 02
0.20885E-01	0.64988E 02	0.58666E 02
0.21329E-01	0.63867E 02	0.58717E 02
0.21774E-01	0.60958E 02	0.58794E 02

TIME	VIN	VOUT
0.22218E-01	0.56343E 02	0.58879E 02
0.22662E-01	0.60886E 02	0.58959E 02
0.23107E-01	0.63828E 02	0.59047E 02
0.23551E-01	0.64983E 02	0.59153E 02
0.23995E-01	0.64319E 02	0.59280E 02
0.24440E-01	0.61854E 02	0.59427E 02
0.24884E-01	0.57657E 02	0.59582E 02
0.25329E-01	0.59875E 02	0.59731E 02
0.25773E-01	0.63255E 02	0.59881E 02
0.26217E-01	0.64864E 02	0.60042E 02
0.26662E-01	0.64657E 02	0.60222E 02
0.27106E-01	0.62640E 02	0.60417E 02
0.27550E-01	0.58869E 02	0.60621E 02
0.27995E-01	0.53450E 02	0.60817E 02
0.28439E-01	0.46535E 02	0.60982E 02
0.28883E-01	0.38317E 02	0.61090E 02
0.29328E-01	0.29026E 02	0.61107E 02
0.29772E-01	0.18923E 02	0.60998E 02
0.30216E-01	0.82894E 01	0.60828E 02
0.30661E-01	0.0	0.60659E 02
0.31105E-01	0.0	0.60491E 02
0.31549E-01	0.0	0.60323E 02
0.31994E-01	0.0	0.60156E 02
0.32438E-01	0.63878E 02	0.59988E 02
0.32883E-01	0.60978E 02	0.59825E 02
0.33327E-01	0.56371E 02	0.59665E 02
0.33771E-01	0.60867E 02	0.59505E 02
0.34216E-01	0.63818E 02	0.59340E 02
0.34660E-01	0.64982E 02	0.59197E 02
0.35104E-01	0.64327E 02	0.59077E 02
0.35549E-01	0.61871E 02	0.58978E 02
0.35993E-01	0.57683E 02	0.58889E 02
0.36437E-01	0.59853E 02	0.58799E 02
0.36882E-01	0.63242E 02	0.58712E 02
0.37326E-01	0.64860E 02	0.58643E 02
0.37770E-01	0.64663E 02	0.58598E 02
0.38215E-01	0.62655E 02	0.58576E 02
0.38659E-01	0.58893E 02	0.58570E 02
0.39103E-01	0.58733E 02	0.58566E 02
0.39548E-01	0.62554E 02	0.58562E 02
0.39992E-01	0.64623E 02	0.58574E 02
0.40436E-01	0.64884E 02	0.58609E 02
0.40881E-01	0.63328E 02	0.58668E 02
0.41325E-01	0.59999E 02	0.58745E 02
0.41770E-01	0.57509E 02	0.58826E 02
0.42214E-01	0.61755E 02	0.58904E 02
0.42658E-01	0.64272E 02	0.58993E 02
0.43103E-01	0.64990E 02	0.59101E 02
0.43547E-01	0.63888E 02	0.59232E 02
0.43991E-01	0.60998E 02	0.59381E 02

TIME	VIN	VOUT
0.44436E-01	0.56400E 02	0.59534E 02
0.44880E-01	0.60847E 02	0.59682E 02
0.45324E-01	0.63807E 02	0.59833E 02
0.45769E-01	0.64981E 02	0.59998E 02
0.46213E-01	0.64335E 02	0.60182E 02
0.46657E-01	0.61889E 02	0.60382E 02
0.47102E-01	0.57710E 02	0.60586E 02
0.47546E-01	0.51914E 02	0.60778E 02
0.47990E-01	0.44666E 02	0.60933E 02
0.48435E-01	0.36168E 02	0.61024E 02
0.48879E-01	0.26656E 02	0.61016E 02
0.49324E-01	0.16399E 02	0.60882E 02
0.49768E-01	0.56823E 01	0.60713E 02
0.50212E-01	0.0	0.60544E 02
0.50657E-01	0.0	0.60376E 02
0.51101E-01	0.0	0.60208E 02
0.51545E-01	0.0	0.60041E 02
0.51990E-01	0.63340E 02	0.59879E 02
0.52434E-01	0.60020E 02	0.59730E 02
0.52878E-01	0.57482E 02	0.59582E 02
0.53323E-01	0.61737E 02	0.59429E 02
0.53767E-01	0.64264E 02	0.59285E 02
0.54211E-01	0.64991E 02	0.59160E 02
0.54656E-01	0.63898E 02	0.59058E 02
0.55100E-01	0.61017E 02	0.58975E 02
0.55544E-01	0.56428E 02	0.58899E 02
0.55989E-01	0.60827E 02	0.58820E 02
0.56433E-01	0.63796E 02	0.58749E 02
0.56878E-01	0.64979E 02	0.58697E 02
0.57322E-01	0.64343E 02	0.58669E 02
0.57766E-01	0.61906E 02	0.58664E 02
0.58211E-01	0.57735E 02	0.58670E 02
0.58655E-01	0.59808E 02	0.58675E 02
0.59099E-01	0.63215E 02	0.58684E 02
0.59544E-01	0.64853E 02	0.58711E 02
0.59988E-01	0.64674E 02	0.58760E 02
0.60432E-01	0.62685E 02	0.58833E 02
0.60877E-01	0.58941E 02	0.58920E 02
0.61321E-01	0.58684E 02	0.59007E 02
0.61765E-01	0.62523E 02	0.59093E 02
0.62210E-01	0.64611E 02	0.59191E 02
0.62654E-01	0.64891E 02	0.59310E 02
0.63097E-01	0.63359E 02	0.59451E 02
0.63541E-01	0.60061E 02	0.59605E 02
0.63984E-01	0.57422E 02	0.59761E 02
0.64428E-01	0.61690E 02	0.59910E 02
0.64871E-01	0.64237E 02	0.60064E 02
0.65315E-01	0.64994E 02	0.60235E 02
0.65758E-01	0.63938E 02	0.60423E 02
0.66202E-01	0.61099E 02	0.60623E 02

TIME	VIN	VOUT
0.66645E-01	0.56557E 02	0.60825E 02
0.67088E-01	0.50438E 02	0.61008E 02
0.67532E-01	0.42911E 02	0.61149E 02
0.67975E-01	0.34189E 02	0.61217E 02
0.68419E-01	0.24514E 02	0.61179E 02
0.68862E-01	0.14155E 02	0.61023E 02
0.69306E-01	0.34001E 01	0.60853E 02
0.69749E-01	0.0	0.60684E 02
0.70193E-01	0.0	0.60516E 02
0.70636E-01	0.0	0.60348E 02
0.71080E-01	0.0	0.60180E 02
0.71523E-01	0.0	0.60013E 02
0.71966E-01	0.59160E 02	0.59847E 02
0.72410E-01	0.58448E 02	0.59678E 02
0.72853E-01	0.62365E 02	0.59506E 02
0.73297E-01	0.64544E 02	0.59344E 02
0.73740E-01	0.64923E 02	0.59203E 02
0.74184E-01	0.63492E 02	0.59085E 02
0.74627E-01	0.60290E 02	0.58983E 02
0.75071E-01	0.57137E 02	0.58887E 02
0.75514E-01	0.61497E 02	0.58787E 02
0.75958E-01	0.64142E 02	0.58698E 02
0.76401E-01	0.64999E 02	0.58630E 02
0.76845E-01	0.64044E 02	0.58587E 02
0.77288E-01	0.61303E 02	0.58565E 02
0.77731E-01	0.56852E 02	0.58553E 02
0.78175E-01	0.60509E 02	0.58539E 02
0.78618E-01	0.63616E 02	0.58533E 02
0.79062E-01	0.64949E 02	0.58545E 02
0.79505E-01	0.64472E 02	0.58583E 02
0.79949E-01	0.62196E 02	0.58643E 02
0.80392E-01	0.58187E 02	0.58716E 02
0.80836E-01	0.59402E 02	0.58788E 02
0.81279E-01	0.62965E 02	0.58862E 02
0.81723E-01	0.64772E 02	0.58952E 02
0.82166E-01	0.64774E 02	0.59064E 02
0.82609E-01	0.62968E 02	0.59197E 02
0.83053E-01	0.59408E 02	0.59344E 02
0.83496E-01	0.58181E 02	0.59491E 02
0.83940E-01	0.62192E 02	0.59634E 02
0.84383E-01	0.64470E 02	0.59785E 02
0.84827E-01	0.64950E 02	0.59954E 02
0.85270E-01	0.63618E 02	0.60142E 02
0.85714E-01	0.60513E 02	0.60343E 02
0.86157E-01	0.55721E 02	0.60543E 02
0.86601E-01	0.49375E 02	0.60723E 02
0.87044E-01	0.41652E 02	0.60857E 02
0.87488E-01	0.32767E 02	0.60914E 02
0.87931E-01	0.22969E 02	0.60861E 02
0.88374E-01	0.12531E 02	0.60699E 02

TIME	VIN	VOUT
0.88818E-01	0.17420E 01	0.60530E 02
0.89261E-01	0.0	0.60362E 02
0.89705E-01	0.0	0.60195E 02
0.90148E-01	0.0	0.60027E 02
0.90592E-01	0.64546E 02	0.59865E 02
0.91035E-01	0.62369E 02	0.59719E 02
0.91479E-01	0.58454E 02	0.59584E 02
0.91922E-01	0.59155E 02	0.59445E 02
0.92366E-01	0.62813E 02	0.59306E 02
0.92809E-01	0.64719E 02	0.59181E 02
0.93252E-01	0.64821E 02	0.59077E 02
0.93696E-01	0.63116E 02	0.58995E 02
0.94139E-01	0.59650E 02	0.58929E 02
0.94583E-01	0.57909E 02	0.58866E 02
0.95026E-01	0.62014E 02	0.58810E 02
0.95470E-01	0.64390E 02	0.58749E 02
0.95913E-01	0.64971E 02	0.58718E 02
0.96357E-01	0.63739E 02	0.58711E 02
0.96800E-01	0.60731E 02	0.58724E 02
0.97244E-01	0.56550E 02	0.58744E 02
0.97687E-01	0.61094E 02	0.58761E 02
0.98131E-01	0.63936E 02	0.58786E 02
0.98574E-01	0.64994E 02	0.58831E 02
0.99017E-01	0.64239E 02	0.58900E 02
0.99461E-01	0.61694E 02	0.58989E 02

```
INPUT DATA RECORD FOR RUN NUMBER 3

ORDER OF EQUATIONS =  2
INITIAL TIME       = 0.0
FINAL TIME         = 0.3700E 00
STEP SIZE          = 0.8320E-04

THE NON-ZERO CONSTANTS, C(I), ARE
              C( 1) = 0.6500E 02
              C( 2) = 0.5000E-03
              C( 3) = 0.1000E 00
              C( 4) = 0.3200E 01
              C( 5) = 0.5800E 02
              C( 6) = 0.1000E 01
              C( 8) = 0.1000E 01

THE NON-ZERO INITIAL CONDITIONS ARE
              X( 1) = 0.5600E 02
              X( 2) = 0.1800E 02


THE COLUMN HEADINGS AND THE CORRESPONDING VARIABLES ARE

         TIME        X( 0)
         VIN         X( 5)
         VOUT        X( 1)
```

TIME	VIN	VCUT
0.0	0.56292E 02	0.56000E 02
0.16640E-02	0.64651E 02	0.56150E 02
0.33280E-02	0.61778E 02	0.56664E 02
0.49920E-02	0.61879E 02	0.57458E 02
0.66559E-02	0.64616E 02	0.58488E 02
0.83198E-02	0.56456E 02	0.59749E 02
0.99838E-02	0.26801E 02	0.60721E 02
0.11648E-01	0.0	0.60511E 02
0.13312E-01	0.0	0.60197E 02
0.14976E-01	0.0	0.59884E 02
0.16640E-01	0.0	0.59573E 02
0.18303E-01	0.0	0.59264E 02
0.19967E-01	0.0	0.58956E 02
0.21631E-01	0.0	0.58650E 02
0.23295E-01	0.0	0.58346E 02
0.24959E-01	0.0	0.58043E 02
0.26623E-01	0.64747E 02	0.57779E 02
0.28287E-01	0.61459E 02	0.57786E 02
0.29951E-01	0.62179E 02	0.58010E 02
0.31615E-01	0.39224E 02	0.58351E 02
0.33279E-01	0.13345E 01	0.58104E 02
0.34943E-01	0.64775E 02	0.57860E 02
0.36607E-01	0.61349E 02	0.57880E 02
0.38271E-01	0.62276E 02	0.58110E 02
0.39935E-01	0.39491E 02	0.58457E 02
0.41599E-01	0.16689E 01	0.58213E 02
0.43263E-01	0.64802E 02	0.57925E 02
0.44926E-01	0.61238E 02	0.57843E 02
0.46590E-01	0.62371E 02	0.57972E 02
0.48254E-01	0.39756E 02	0.58230E 02
0.49918E-01	0.57267E 02	0.57965E 02
0.51582E-01	0.64828E 02	0.57709E 02
0.53246E-01	0.61125E 02	0.57739E 02
0.54910E-01	0.62464E 02	0.57983E 02
0.56574E-01	0.40020E 02	0.58361E 02
0.58238E-01	0.23381E 01	0.58133E 02
0.59902E-01	0.64851E 02	0.57868E 02
0.61566E-01	0.61010E 02	0.57854E 02
0.63229E-01	0.62559E 02	0.58048E 02
0.64892E-01	0.40310E 02	0.58377E 02
0.66555E-01	0.27300E 01	0.58136E 02
0.68218E-01	0.64878E 02	0.57862E 02
0.69881E-01	0.60857E 02	0.57833E 02
0.71544E-01	0.62680E 02	0.58011E 02
0.73207E-01	0.40664E 02	0.58333E 02
0.74870E-01	0.31822E 01	0.58094E 02
0.76533E-01	0.64904E 02	0.57838E 02
0.78196E-01	0.60696E 02	0.57852E 02
0.79859E-01	0.62799E 02	0.58069E 02
0.81522E-01	0.41017E 02	0.58432E 02

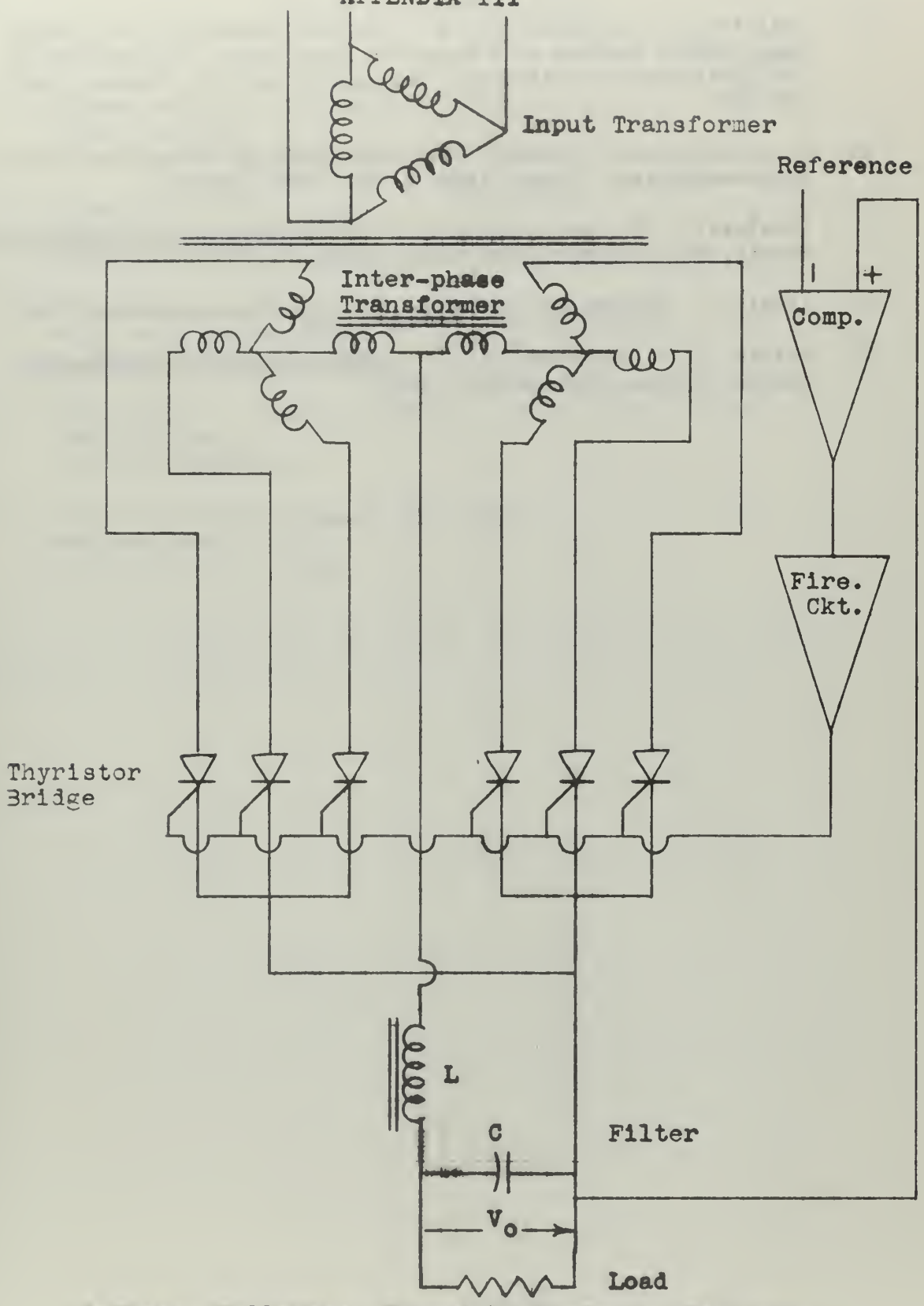
TIME	VIN	VOUT
0.82185E-01	0.36353E 01	0.58209E 02
0.84848E-01	0.64927E 02	0.57924E 02
0.86511E-01	0.60533E 02	0.57861E 02
0.88174E-01	0.62914E 02	0.58000E 02
0.89837E-01	0.41367E 02	0.58296E 02
0.91500E-01	0.40872E 01	0.58057E 02
0.93163E-01	0.64947E 02	0.57807E 02
0.94826E-01	0.60366E 02	0.57835E 02
0.96489E-01	0.63026E 02	0.58065E 02
0.98152E-01	0.41716E 02	0.58454E 02
0.99815E-01	0.45398E 01	0.58248E 02
0.10148E 00	0.64964E 02	0.57949E 02
0.10314E 00	0.60197E 02	0.57831E 02
0.10480E 00	0.63136E 02	0.57913E 02
0.10647E 00	0.42062E 02	0.58169E 02
0.10813E 00	0.58621E 02	0.57924E 02
0.10979E 00	0.64977E 02	0.57690E 02
0.11146E 00	0.60024E 02	0.57745E 02
0.11312E 00	0.63242E 02	0.58003E 02
0.11478E 00	0.42407E 02	0.58435E 02
0.11644E 00	0.54435E 01	0.58257E 02
0.11811E 00	0.64988E 02	0.57957E 02
0.11977E 00	0.59849E 02	0.57841E 02
0.12143E 00	0.63345E 02	0.57921E 02
0.12310E 00	0.42750E 02	0.58186E 02
0.12476E 00	0.59007E 02	0.57951E 02
0.12642E 00	0.64995E 02	0.57711E 02
0.12809E 00	0.59671E 02	0.57760E 02
0.12975E 00	0.63445E 02	0.58008E 02
0.13141E 00	0.43090E 02	0.58440E 02
0.13307E 00	0.63461E 01	0.58271E 02
0.13474E 00	0.64999E 02	0.57970E 02
0.13640E 00	0.59489E 02	0.57844E 02
0.13806E 00	0.63542E 02	0.57911E 02
0.13973E 00	0.43428E 02	0.58174E 02
0.14139E 00	0.59381E 02	0.57946E 02
0.14305E 00	0.65000E 02	0.57696E 02
0.14471E 00	0.59306E 02	0.57736E 02
0.14638E 00	0.63636E 02	0.57974E 02
0.14804E 00	0.43764E 02	0.58409E 02
0.14970E 00	0.72475E 01	0.58252E 02
0.15137E 00	0.64998E 02	0.57951E 02
0.15303E 00	0.59118E 02	0.57829E 02
0.15469E 00	0.63727E 02	0.57899E 02
0.15636E 00	0.44098E 02	0.58176E 02
0.15802E 00	0.59744E 02	0.57961E 02
0.15968E 00	0.64992E 02	0.57714E 02
0.16134E 00	0.58929E 02	0.57756E 02
0.16301E 00	0.63815E 02	0.57993E 02
0.16467E 00	0.44430E 02	0.58434E 02

TIME	VIN	VOUT
0.16633E 00	0.81475E 01	0.58291E 02
0.16800E 00	0.64984E 02	0.57988E 02
0.16966E 00	0.58736E 02	0.57834E 02
0.17132E 00	0.63899E 02	0.57869E 02
0.17299E 00	0.44760E 02	0.58122E 02
0.17465E 00	0.60095E 02	0.57917E 02
0.17631E 00	0.64972E 02	0.57727E 02
0.17797E 00	0.58541E 02	0.57824E 02
0.17964E 00	0.63981E 02	0.58109E 02
0.18130E 00	0.45087E 02	0.58601E 02
0.18296E 00	0.90459E 01	0.58492E 02
0.18463E 00	0.0	0.58189E 02
0.18629E 00	0.58342E 02	0.57884E 02
0.18795E 00	0.64059E 02	0.57700E 02
0.18962E 00	0.62980E 02	0.57783E 02
0.19128E 00	0.60435E 02	0.58107E 02
0.19294E 00	0.34904E 02	0.58448E 02
0.19460E 00	0.0	0.58171E 02
0.19627E 00	0.64134E 02	0.57899E 02
0.19793E 00	0.62867E 02	0.57833E 02
0.19959E 00	0.60601E 02	0.58003E 02
0.20126E 00	0.35286E 02	0.58206E 02
0.20292E 00	0.57937E 02	0.57907E 02
0.20458E 00	0.64207E 02	0.57700E 02
0.20624E 00	0.62750E 02	0.57765E 02
0.20791E 00	0.60763E 02	0.58066E 02
0.20957E 00	0.35665E 02	0.58406E 02
0.21123E 00	0.0	0.58133E 02
0.21290E 00	0.64276E 02	0.57864E 02
0.21456E 00	0.62631E 02	0.57818E 02
0.21622E 00	0.60922E 02	0.58004E 02
0.21789E 00	0.36044E 02	0.58241E 02
0.21955E 00	0.57520E 02	0.57948E 02
0.22121E 00	0.64341E 02	0.57720E 02
0.22287E 00	0.62508E 02	0.57764E 02
0.22454E 00	0.61079E 02	0.58041E 02
0.22620E 00	0.36420E 02	0.58375E 02
0.22786E 00	0.0	0.58106E 02
0.22953E 00	0.64404E 02	0.57861E 02
0.23119E 00	0.62382E 02	0.57863E 02
0.23285E 00	0.61232E 02	0.58090E 02
0.23452E 00	0.36795E 02	0.58379E 02
0.23618E 00	0.0	0.58103E 02
0.23784E 00	0.64464E 02	0.57849E 02
0.23950E 00	0.62253E 02	0.57842E 02
0.24117E 00	0.61383E 02	0.58059E 02
0.24283E 00	0.37167E 02	0.58348E 02
0.24449E 00	0.0	0.58075E 02
0.24616E 00	0.64520E 02	0.57832E 02
0.24782E 00	0.62121E 02	0.57848E 02

TIME	VIN	VCUT
0.24948E 00	0.61531E 02	0.58087E 02
0.25114E 00	0.37538E 02	0.58404E 02
0.25281E 00	0.0	0.58138E 02
0.25447E 00	0.64574E 02	0.57874E 02
0.25613E 00	0.61986E 02	0.57847E 02
0.25780E 00	0.61675E 02	0.58040E 02
0.25946E 00	0.37907E 02	0.58322E 02
0.26112E 00	0.0	0.58052E 02
0.26279E 00	0.64624E 02	0.57828E 02
0.26445E 00	0.61849E 02	0.57875E 02
0.26611E 00	0.61817E 02	0.58138E 02
0.26777E 00	0.38274E 02	0.58492E 02
0.26944E 00	0.0	0.58240E 02
0.27110E 00	0.64671E 02	0.57942E 02
0.27276E 00	0.61708E 02	0.57808E 02
0.27443E 00	0.61955E 02	0.57893E 02
0.27609E 00	0.64586E 02	0.58194E 02
0.27775E 00	0.56603E 02	0.58746E 02
0.27942E 00	0.27093E 02	0.59076E 02
0.28108E 00	0.0	0.58770E 02
0.28274E 00	0.0	0.58465E 02
0.28440E 00	0.0	0.58162E 02
0.28607E 00	0.56825E 02	0.57875E 02
0.28773E 00	0.64756E 02	0.57709E 02
0.28939E 00	0.61417E 02	0.57826E 02
0.29106E 00	0.62224E 02	0.58157E 02
0.29272E 00	0.39364E 02	0.58598E 02
0.29438E 00	0.15342E 01	0.58381E 02
0.29605E 00	0.0	0.58078E 02
0.29771E 00	0.61267E 02	0.57776E 02
0.29937E 00	0.62353E 02	0.57666E 02
0.30103E 00	0.64418E 02	0.57793E 02
0.30270E 00	0.57259E 02	0.58188E 02
0.30436E 00	0.28323E 02	0.58428E 02
0.30602E 00	0.0	0.58125E 02
0.30769E 00	0.62480E 02	0.57871E 02
0.30935E 00	0.64356E 02	0.57804E 02
0.31101E 00	0.57472E 02	0.58006E 02
0.31267E 00	0.28730E 02	0.58080E 02
0.31434E 00	0.60958E 02	0.57800E 02
0.31600E 00	0.62603E 02	0.57715E 02
0.31766E 00	0.64291E 02	0.57867E 02
0.31933E 00	0.57682E 02	0.58281E 02
0.32099E 00	0.29136E 02	0.58556E 02
0.32265E 00	0.0	0.58254E 02
0.32432E 00	0.62723E 02	0.57948E 02
0.32598E 00	0.64222E 02	0.57707E 02
0.32764E 00	0.57890E 02	0.57736E 02
0.32930E 00	0.64913E 02	0.57956E 02
0.33097E 00	0.50593E 02	0.58441E 02

TIME	VIN	VOUT
0.33263E 00	0.17031E 02	0.58471E 02
0.33429E 00	0.0	0.58168E 02
0.33596E 00	0.58095E 02	0.57878E 02
0.33762E 00	0.64935E 02	0.57701E 02
0.33928E 00	0.60473E 02	0.57812E 02
0.34095E 00	0.62955E 02	0.58126E 02
0.34261E 00	0.41494E 02	0.58592E 02
0.34427E 00	0.42504E 01	0.58411E 02
0.34593E 00	0.0	0.58107E 02
0.34760E 00	0.60305E 02	0.57812E 02
0.34926E 00	0.63066E 02	0.57689E 02
0.35092E 00	0.63999E 02	0.57814E 02
0.35259E 00	0.58496E 02	0.58197E 02
0.35425E 00	0.30745E 02	0.58489E 02
0.35591E 00	0.0	0.58191E 02
0.35757E 00	0.63175E 02	0.57904E 02
0.35924E 00	0.63918E 02	0.57768E 02
0.36090E 00	0.58691E 02	0.57894E 02
0.36256E 00	0.64981E 02	0.58203E 02
0.36423E 00	0.51711E 02	0.58769E 02
0.36589E 00	0.18774E 02	0.58887E 02
0.36755E 00	0.0	0.58581E 02
0.36922E 00	0.0	0.58277E 02

APPENDIX III



3-Phase, Full-Wave, Forced Limit-Cycle, Regulator.

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13. ABSTRACT

The recent introduction of high current-capacity thyristors has advanced the status of solid-state power supplies. ON-OFF switching of an entire rectifier, bridge, rather than individual thyristors, provides a simple and economical method of control and regulation. This control philosophy causes the system to limit cycle.

A describing function is developed to model the power-supply input transformer and rectifier bridge. The describing function is then used to predict the frequency and amplitude of the limit cycle.

A digital computer program is used to construct the describing function curves, and to simulate the dynamic response of the system. Limit cycle predictions are compared with the simulated response to verify the describing function validity.

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Thyristor						
Nonlinear						
Frequency response						
Describing Function						
Limit Cycle